

COAL AGE

Vol. 13

NEW YORK, JANUARY 5, 1918

No. 1

MUTUAL CAPITALIZING

IN ALL HUMAN AFFAIRS today there is a mighty trend toward mutualism. It is stronger and more resistless than any other single force in the world at the present time.

WHEN the United States drew the sword against frightfulness, her captains of industry were among the first to pledge their loyalty. The atmosphere of misunderstanding between the Government and "Big Business" was dissipated in a day. In its place came the light of a clearer understanding, which showed the mutual interdependence of all classes of industry. Both employers and employees are coming to see that they and their fortunes are indissolubly linked together. Both are getting the vision of a nation that stands for all a man can hold dear, and that depends on their united labors for regular and increased production.

IN THE LIST of such industries coal mining stands first. With his own boy "Over There," the miner, superintendent or manager can see in a ton of coal the making of shells and other munitions, without which his boy is helpless.

THAT PARTY—employer or employee—who retards the progress of any kind of essential business now by reason of unfair pay, unjust treatment, or by strikes, will come squarely before the great tribunal of public opinion; and that court will not be

slow in rendering its decision when it remembers the millions of "Our Boys" who are either in or on their way to the trenches in France.

MINING MEN OF AMERICA,

are you fully alive to your responsibilities? Are you awake to the necessity of capitalizing every resource, every circumstance and every condition for the benefit of America? Are you alive to the fact that the best kind of capitalizing is the mutual kind? How can it be done?

First: By remembering that the interests of employer and employee are identical. Profits and earnings are no longer the first consideration, but coal for the country's needs. There should be an end of operators' and miners' representatives rushing to Washington to press their respective claims. Instead there should be hundreds of mining concerns sending telegrams to the president or to the Fuel Administrator, signed by the company and by the men pledging continuous operation for the period of the war.

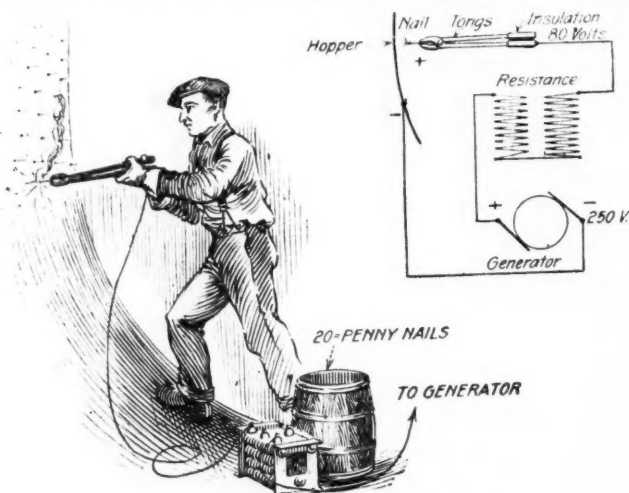
Second: By individual acts showing appreciation of your duties. How? By putting into actual practice, as nearly as you can, the Golden Rule. Every single act that you perform to bind your men more closely to you is an act of mutual capitalization. The same thing is true of the miner. The time for each and all of us to show a full measure of loyalty to company and nation is here. Your boy, as a soldier, is part of a great military machine, and for the period of the war has practically laid aside his individualism. Can you do less here at home? Can you stay off the job for a day when the loss of each hour's tonnage means a round of cartridges less for the boy "Over There."

THE TIME HAS COME for the mutual capitalization of every coal-mine company in America. Without a clear understanding of this fact, our industry may unintentionally contribute to the lengthening of the conflict. Prussianism must be banished; America's coal men must play their big part wholeheartedly.

IDEAS AND SUGGESTIONS

Homemade Arc Welding Outfit

The Clearfield Bituminous Coal Corporation, of Clearfield, Penn., recently found it necessary to weld wire nails to the inside of a steel hopper at one of its plants. Steel lath were to be fastened to the nails and covered with 1½ in. of cement. Not desiring to purchase an arc welding outfit to do this work, the company's electrician got busy and made one from material he had at hand, this consisting of two pieces of copper



HOW THE WELDS WERE MADE

wire, a pair of blacksmith tongs, insulating tape and a resistance.

The negative wire was fastened to the steel hopper, and the positive wire to the blacksmith tongs, and in order to secure the proper voltage a resistance was placed on the positive wire. The voltage being 250 direct current, it was necessary to reduce it to about 80 volts. The handles of the tongs were well insulated. The operator then picked up a tenpenny nail and held it to the side of the hopper, an arc being produced that welded the nail solidly to the side of the hopper.

Imagination and the Engineer

BY E. LEWELLYN
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It may sound, to the young, rather prosaic to suggest that a cultivated imagination is an absolute essential to a successful engineering career. However, the successful engineer will readily confirm the foregoing statement, and the fair-minded reader will readily acknowledge that all engineering projects which have been successfully completed in a very large measure owe their creation to someone who saw clearly, in his mind's eye, the benefits to be derived from the materialization of the image of his cultivated imagination.

It will readily be conceded that the unimaginative technical man does not, as a rule, attain a position of prominence in his chosen field; and it is largely due to

the fact that he is usually content with the world as he finds it. He sees no way of reducing the cost of production of the world's necessities, neither does he see, in his mind's eye, any means of improvement, or refinement, in the production of the product of which he is, in part, a producer.

It may be well to emphasize here that in placing on the market any given product the social labor of many men is required. And in the production of coal the labor of the uncouth, unlearned laborer of a foreign tongue is united with that of men from our foremost seats of learning. Together, they apply their social labor to supply one of the absolute necessities of present-day society.

ENGINEER IS CALLED UPON TO SOLVE MANY PROBLEMS

On the shoulders of the trained engineer of today rests the burden of solving the intricate problems, which are becoming more and more intricate, incidental to the economical production of coal. It is his lot to devise ways and means of applying the labor of the untrained worker so as to obtain more efficient service. Furthermore, to him is assigned the problems of eliminating unprofitable labor, through the introduction of labor-saving machinery, as well as the task of introducing refinements that will enhance the market value of coal.

A survey of the progress made in the production of coal since the inception of the industry reveals many improvements and refinements that have resulted either in reducing the cost of production or in enhancing the market value of the product. And a careful study of their improvements will reveal the fact that they owe their creation to the cultivated imagination of someone who was dissatisfied with conditions as he found them.

A technical man who does not think that the present mode of producing and preparing coal embodies all the refinements and economies that are possible, and who is also given to cultivating his powers of imagination, holds within himself the essentials of a successful engineer. He has but to study conditions as he finds them, and, as he is given to much thought, the logical result is the materialization of an idea that adds to the value of the product or the reducing of the cost of production. Moreover, he enhances his own personal fortune and his services are in greater demand, simply because he has exercised the faculties which all men possess, but very few have wisely chosen to use.

Too often the young engineer is prone to say that "it is all very well to point out ideas, the materialization of which has effected large economies in the production of the world's wealth, but today everything is refined or standardized, and the avenue of opportunity is closed." Right here is where the man who is given to cultivating his powers of imagination sees the further refinement, the further economies that are possible, and gradually rises above the army of men who are "content with things as they are."

It may be pertinent to suggest that before you attack the next task that you are assigned—it matters not in what particular branch of engineering work you are engaged—try to picture in your “mind’s eye,” in the quiet of your room, the means you will employ to complete successfully the work in hand. Analyze your proposed method of doing the work; ask yourself if it is not possible to improve the usual mode. Try to picture in your “mind’s eye” the completed task; ask yourself, “Will it meet all the requirements that are expected of it?” Your superior may ask you, “Why not beat him to it?” The engineer who uses his “mind’s eye” to solve the daily problems that beset him, be they large or small, to him will ultimately be assigned the task of solving the great problems, the solution of which requires the mind of a masterman. Mr. Engineer, cultivate your powers of imagination!

As evidence that the coal industry contains a few problems the solution of which will require the powers of imagination of trained technical men, the following are a few thoughts that may be pertinent:

Further refinements in the preparation of coal; reducing breakage of coal in the course of preparation. Further improvements of coal jigs, so that they may become absolutely automatic. Better designed breaker machinery, for the purpose of eliminating the present large friction load. The training of mine employees, so as to effect the reduction of the present day very large cost of maintenance of breaker and allied machinery. Further reasearch work in the mines, to ascertain if possible the most economical size that coal should be sent from the mines to the breaker. Less expensive methods of purifying acidulous mine water for boiler use. More efficient storage-battery locomotives. Less expensive methods of constructing concrete supports and structures. The standardization, in every large coal company, of boiler-room protection, so as to effect more efficient generation of steam and lower cost of upkeep.

Dumping Mine Refuse

BY J. A. SMITH
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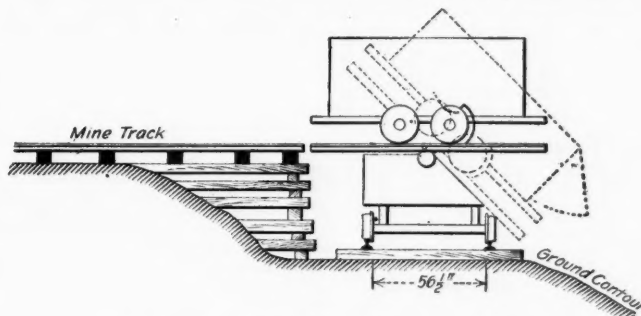
The accompanying sketch shows a simple arrangement for dumping mine waste where the mine opening is but a short distance above water level, and where the usual type of slate dump would not be advisable because of the expense of moving it ahead at frequent intervals. The distance that the slate track is above the general surface level is often so small that the dumping of a few cars would fill the space. The sketch shows how one company overcame this difficulty.

A short track for cars loaded with refuse was laid with a crib 4 ft. or over high, under its end. At the bottom of the crib another track was put in at right angles to the first. This lower track should be at least of standard gage, or more, in order to permit of the truck moving thereon to have a base sufficient to steady the dump. This lower track can be extended in either direction on a level grade around the contour of the hillside.

In the case above mentioned, a truck was built upon this track with its top platform level with the top of the ties under the slate track, and a dump securely

mounted thereon. A car loaded with slate coming from the mine is run out over the slate track onto this dump. The truck is then run in either direction, dumped, and brought back into position, the mine car being pushed back onto the slate track.

When the space below the track is completely filled, the track can be swung out to the edge of the fill and



SCHEME FOR DUMPING MINE WASTE

dumping again started. If there is likelihood of more than one car of slate coming out at one time, it will be best to have two tracks extending to the edge of the crib, one for the loaded cars and the other for the empty ones. There is no necessity of extending the crib, as the truck track can be brought out to the edge of the fill by curving the rails near the crib.

Put It Up to Uncle Sam

The railroad fails to deliver coal cars, and a loud outcry comes from the mine; but how about the mine force: Is it ready to do its part when the cars reach the siding? Are the tracks leading to the tippie promptly freed of snow? Are the switches and frogs duly shoveled, salt-sprinkled and swept clean? Are the necessary snow fences erected to make such shoveling less onerous?

The duty of every mine manager is to fill railroad cars as soon as they are run on the siding, and to keep private sidings reasonably clear of snow. For this purpose, organization is needed. Some attempt should be made to get even the miners to help. If some of these men cannot be attracted to this unpleasant but necessary work, a right principle has not been instilled in them.

Then again, are the pipe lines at your mine kept free of frost and the pumps prevented from freezing? Are your airways and shafts kept free of ice? Too often a superintendent regards a severe frost as some inexplicable phenomenon which he was entitled not to anticipate. A high stage in the river, creek or run which destroys a bridge and so shuts off railroad cars, mine cars or supply wagons is regarded as an unfortunate disposition of inconsiderate Providence, whereas the outcome was to be looked for and should have been guarded against.

As good citizens we should be forearmed against these untoward happenings. The total loss of a bituminous mine might injure the output of the United States only inconsiderably, but a mine that inconsiderately receives its allotment and for some reason or other fails to fill it is doing the nation a great disfavor, for it is holding cars idle which another mine would fill if those cars had been pushed into its siding. Put it up to Uncle Sam all the time. Don't let him give you the cars and then fall down when he puts it up to you.

Anthracite and Bituminous Coal Storage

By HORACE GOLDSTEIN

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SYNOPSIS—*The storage of coal between the mine and the point of consumption acts as a safety valve for one and a flywheel to the other. The means employed in the storage of anthracite is radically different from that employed for bituminous, since the behavior of the two in storage varies widely. In storing bituminous, care must be exercised not to pile the coal too deep.*

THE coal pile located somewhere between the mine and the boiler room is a safety valve to the consumer and an equalizer to the producer. Without the storage pile, it would not be economical to run the mines at a reduced rate when the demand for the coal is small, as is the case in the summer; and neither could the mine produce sufficient coal to take care of the winter demand except under heavy stress and decreased efficiency.

The price of coal in the summer is usually such that it pays the consumer to lay in a goodly supply to take care of part of the winter demands, and to carry a sufficient amount in storage to tide over strikes, storms and other interruptions in delivery.

All coals are shipped to any of three places: (1) Direct from the mine to the consumer for his immediate needs; (2) direct to the consumer to be stored closely adjacent to the boiler house, or in the storage plant located between the mine and the boiler house; (3) to a central storage where the producer allows the coal to accumulate in large quantities against a demand rate greater than the rate of source supply, or until a favorable market presents itself.

Except for small plants, there are few cases where no provision is made for coal storage of some kind or other. Location of buildings, yard space, fire insurance, etc., have considerable bearing on the amount of coal carried directly at the plant. In some cases it has been known that the consumers have made arrangements with local fuel dealers whereby these dealers carry in their yard a certain amount of coal which is always subject to the call of the consumer. Different arrangements for paying for this privilege have been agreed upon, and the cost thereof is often called a "premium on coal-supply insurance."

Coal-storage systems can be divided into two main classes—anthracite and bituminous. Anthracite coal is comparatively easy to handle; it flows readily and can be piled to any desired height. Bituminous presents problems which require extra attention, and arrangements must be made to suit the particular case in question. Bituminous coal will not flow as readily as anthracite; the lumps are many times larger, requiring larger and heavier equipment, and there is always present the danger of fire from spontaneous combustion. Coal of this kind has been known to fire when piled only 6 to 8 ft. high. It has also been piled 35 to 40 ft. deep without firing, but in cases of this kind it is always

advisable to keep the coal moving in and out of storage, so as not to give it much chance to heat.

Any handling equipment for bituminous-coal storage should be arranged so that any portion of the coal pile can be removed without interfering with the rest of the storage. This will permit the digging out and turning over of the coal as soon as heating occurs, and by doing this fires are prevented. With apparatus thus designed, the fires, when they occur, are easily handled and are not a source of much annoyance or loss to the owner. With little care one can observe the coal pile heating and can relieve the situation without any serious results. Oftentimes coal is turned two or three days or even a week after heating becomes noticeable. The following table gives the capacity in tons of 2000 lb. for conical and rectangular piles for both bituminous and anthracite coal:

TABLE I. CAPACITIES OF COAL PILES

Conical Piles						Rectangular Piles			
Bituminous			Anthracite			Bitum.		Anth.	
Base Angle = 36 Deg.			Base Angle = 27 Deg.			Base Angle = 36 Deg.		Base Angle = 27 Deg.	
Tons (2,000 lb.)	H ³		Tons (2,000 lb.)	H ³		Tons per Ft.	H ²	Tons per Ft.	H ²
Height Ft.	Diam. of Base (2,000 lb.)	Tons (2,000 lb.)	Height Ft.	Diam. of Base (2,000 lb.)	Tons (2,000 lb.)	Height Ft.	Tons per Ft.	Height Ft.	Tons per Ft.
5	14.3	6.2	5	19.7	12.5	5	0.83	5	1.25
6	17.1	10.8	6	23.6	21.6	6	1.2	6	1.80
8	22.8	25.6	8	31.5	51.2	8	2.1	8	3.20
9	25.7	36.4	9	35.4	72.9	9	2.7	9	4.00
10	28.6	50.0	10	39.4	100.0	10	3.3	10	5.00
12	34.2	86.4	12	47.2	172.8	12	4.8	12	7.20
15	42.9	168.7	15	59.1	337.5	15	7.5	15	11.20
18	51.4	291.6	18	70.8	583.2	18	10.8	18	16.20
20	57.2	400.0	20	78.8	800.0	20	13.3	20	20.00
22	62.9	532.4	22	86.6	1,080.0	22	16.1	22	24.20
25	71.5	781.2	25	98.5	1,562.0	25	20.8	25	31.20
28	80.0	1,097.6	28	110.3	2,200.0	28	26.1	28	39.20
30	85.8	1,350.0	30	118.2	2,700.0	30	30.0	30	45.00
35	100.1	2,143.7	35	137.9	4,280.0	35	40.8	35	61.20
40	114.4	3,200.0	40	157.6	6,400.0	40	53.3	40	80.00
50	143.0	6,250.0	50	197.0	12,500.0	50	83.3	50	125.00

The storage of anthracite coal can be divided into two systems—conical piling and rectangular piling. Fig. 1 shows a unit element of the conical storage system. As usually arranged for open-air storage, this consists of two trimmers or stocking-out machines, as shown, and one reloader located between them. A storage plant is made up of a number of these groups, and the individual elements can be of the same or varied capacities. With this arrangement it is practicable to put up a plant for storing any desired amount of material. The groups

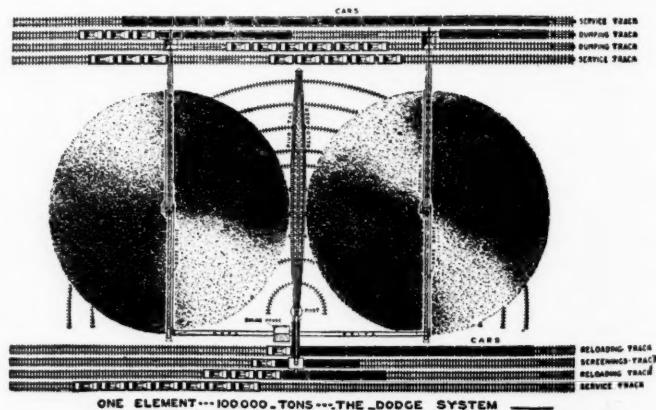


FIG. 1. UNIT OF CONICAL STORAGE SYSTEM

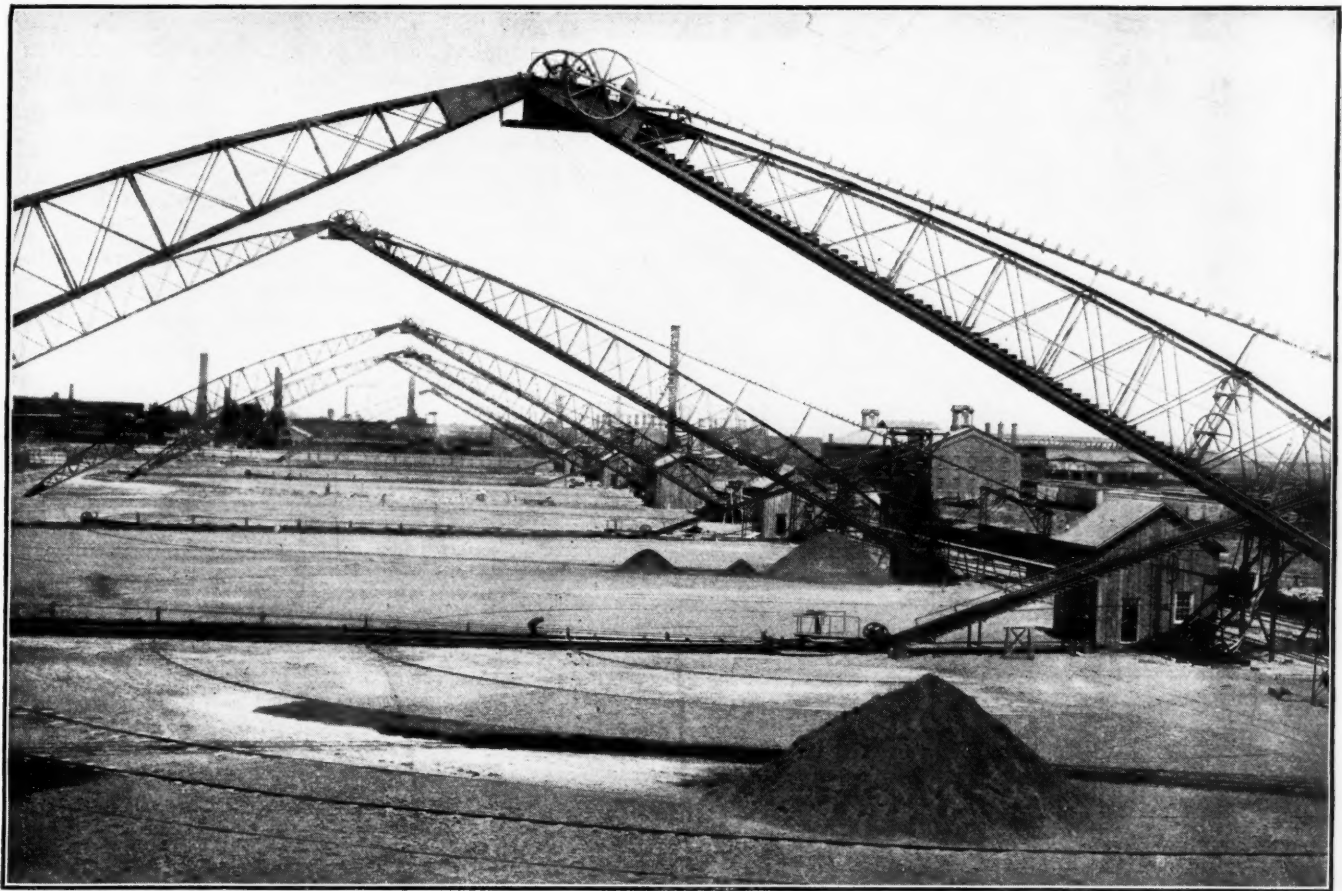


FIG. 2. STOCKING-OUT AND RECLAIMING MACHINES OF THE CONICAL-STORAGE SYSTEM

usually have a capacity of 100,000 to 120,000 tons each. The coal which is received from the mines is dumped into hoppers beneath the railroad tracks and conveyed to the trimmer conveyor, which stores it in a conical pile. In handling anthracite coal, care must be taken to minimize the breakage. Breakage in this kind of coal is a decided loss. All the coal reclaimed from storage is rescreened, and the smaller sizes are sold for less than the larger, while the fines bring very little. Tables II and III give the percentage of breakage in the different kinds of coal for different heights of fall. A careful study of these tables will show the desirability of eliminating degradation as far as possible.

The trimmer conveyor is of the scraper flight type, and is clearly shown in Fig. 2. The bottom of the trough for the carrying run of this conveyor is of the movable ribbon type. The coal which is received from the cars is scraped along the trimmer truss and forms a small pile at the foot similar to that shown under the second trimmer in Fig. 2. The steel ribbon serving as a bottom for the trough is advanced with the ascending apex of the coal pile. This avoids a drop and effectually prevents degradation. The coal discharged from the trough rolls down the side of the pile already formed. This method does away with all dropping of the coal, and has proved to be highly efficient.

A large storage plant of this type which has been in use for some time has a capacity of 480,000 tons, and is divided into eight piles, four on each side of a central railroad system. Each pile has a capacity of 60,000 tons, and the conveying system is capable of stocking out 1800 tons per day of 10 hours, for each of the in-

clined conveyors, or a total capacity for storage of 14,400 tons per day. For replacing the coal in cars, each reloader has a capacity of 2500 tons per 10 hours, and as there are four reloaders, the reclaiming capacity of the plant is 10,000 tons per day.

The reloader is a long horizontal conveyor, which is pivoted at one end and moves on circular tracks on the

TABLE II. BREAKAGE IN DROPPED COAL

Detailed Percentage of Smaller Sizes Resulting from Various Heights of Drop

Size of Coal Dropped	Drop in Feet	Egg	Stove	Nut	Total Prep.	Pea	Buck.	Rice and Barley	Total Small	Total Break- age
Broken.....	10	3.65	2.11	1.63	7.39	0.77	0.82	1.05	2.64	10.03
	20	8.18	5.51	4.34	18.03	1.92	1.74	2.33	5.99	24.02
	30	10.96	3.58	2.33	16.87	1.34	1.08	0.98	3.40	20.27
Egg.....	10	7.72	2.40	10.12	0.82	0.87	1.46	3.15	13.27	
	20	8.38	4.10	12.48	2.18	1.81	2.36	6.35	18.82	
	30	13.39	4.91	18.30	2.09	1.61	2.25	5.95	24.25	
Stove.....	10	5.98	5.98	1.67	1.21	1.12	4.00	9.98		
	20	6.26	6.26	2.33	1.84	2.43	6.60	12.86		
	30	12.66	12.66	3.53	2.25	3.07	8.87	21.51		
Nut.....	10	4.91	2.52	1.48	8.91	8.91				
	20	5.07	2.83	3.26	11.16	11.16				
	30	8.63	4.00	3.69	16.32	16.32				
Pea.....	10	5.37	1.38	6.75	6.75					
	20	6.47	3.10	9.57	9.57					
	30	11.44	5.63	17.07	17.07					
Buckwheat..	10	3.38	3.38	3.38	3.38					
	20	6.26	6.26	6.26	6.26					
	30	6.13	6.13	6.13	6.13					

ground. The flights of the scraper line come in contact with the outer edge of the base of the pile, since the side of the conveyor trough is open toward the pile, as is seen in Fig. 3. The coal is thus drawn to a central point, taken up an incline, and loaded into cars.

The coal is passed over shaking screens at the head of the inclined conveyor before delivery to the cars. Fig. 3 shows the operator at the pivot of the reloading



FIG. 3. RECLAIMING CONVEYOR OF THE CONICAL-STORAGE SYSTEM

conveyor, the scraper taking the coal from the base of pile, and the inclined conveyor taking the coal to the tower for screening and delivery to cars. Fig. 4 shows the arrangement of the machinery at the point of discharge to the cars

RECTANGULAR PILING OF COAL

For rectangular piling, a single trimmer conveyor, as shown in Fig. 5, is supported at its base or foot by a traveling truck, its upper end resting upon a track laid on a long girder which is supported by heavy columns and held securely by guy ropes. This trimmer receives the coal from a series of bins built under the railroad trestle, which runs parallel to the trimmer runway. The discharge from the trimmer to the storage is arranged with a ribbon trough bottom, and the pile is thus formed with a minimum of breakage. The trimmer may be moved from bin to bin, and this results in the formation of a solid pile of coal.

In the particular case illustrated, the pile is 83 ft. high at the apex, 342 ft. wide at the base and 1244 ft. long. The capacity is 400,000 tons and may be increased by merely extending the storage area and the trimmer runway. For reclaiming the coal, two reloaders are used (mounted on straight parallel tracks) one

on each side of the central overhead runway. These reloaders supply two scraper conveyors which run in a longitudinal underground tunnel; these in turn deliver to a transfer conveyor, and the coal is thus carried to the reloading tower, where it is screened and sized for car delivery.

Fig. 6 shows a "hillside" storage plant. Here the coal is received on a trestle and is discharged through chutes direct to the inclined storage floor. When this storage has received all the coal which will flow to it by gravity, the coal is next diverted from the hoppers to the foot of an electrically-operated traveling cantilever trimmer conveyor, which elevates it and completes the storage pile. The retaining wall at the bottom of the slope is fitted with gates and chutes for reloading. Plants of this nature are the exception, and the location of both discharge and loading tracks as to elevation and centers are such in this particular case as are rarely obtained.

The rectangular pile, in order to secure the large capacities referred to, cannot avoid mixing the different sizes of coal at the junction points of the piles of the various kinds. With a storage pile of about 360,000 tons, the storage cost per ton is somewhat lower than it would be with six 60,000-ton conical piles. The cost of equipment for the rectangular pile can safely be figured, including all material and labor, under normal conditions, at about 90c. per ton, based on the maximum capacity; whereas the six-pile conical system of equivalent capacity will cost about 98c. to \$1 per ton. The cost of land, grading, surfacing, drainage, power plant and railroad-track system are included in the foregoing figures. The two systems can briefly be compared as follows:

A. For stocking out, the capacity of the conical system is six to eight times that of the rectangular system, depending on the number of piles. The reloading is

TABLE III. BREAKAGE IN DROPPED COAL
Percentage of Sizes in Undersize Screened Out from Screened Coal

Original Size of Coal	Egg %	Stove %	Nut %	Total Prep. %	Pea %	Buck %	Rice %	Barley & Dirt %	Total Small %
Broken.....	85.5	7.5	3.5	96.5	1.0	0.9	0.8	0.8	3.5
Egg.....		84.3	13.2	97.5	1.1	0.8	0.3	0.3	2.5
Stove.....			90.0	90.0	5.3	2.1	1.7	0.9	10.0
Nut.....					84.0	8.0	6.8	1.2	100.0
Pea.....						89.7	8.1	2.2	100.0
Buckwheat.....							92.2	7.8	100.0

Average Per Cent. Sizes in Undersize from Dropped Coal

Original Size of Coal	Egg %	Stove %	Nut %	Total Prep. %	Pea %	Buck %	Rice %	Total Small %	Total All Sizes %
Broken.....	42.0	20.6	15.2	77.8	7.4	6.7	8.1	22.2	100.0
Egg.....		52.3	20.2	72.5	9.0	7.6	10.9	27.5	100.0
Stove.....			56.0	56.0	17.0	12.0	15.0	44.0	100.0
Nut.....					51.2	25.7	23.1	100.0	100.0
Pea.....						69.7	30.3	100.0	100.0
Buckwheat.....							100.0	100.0	100.0

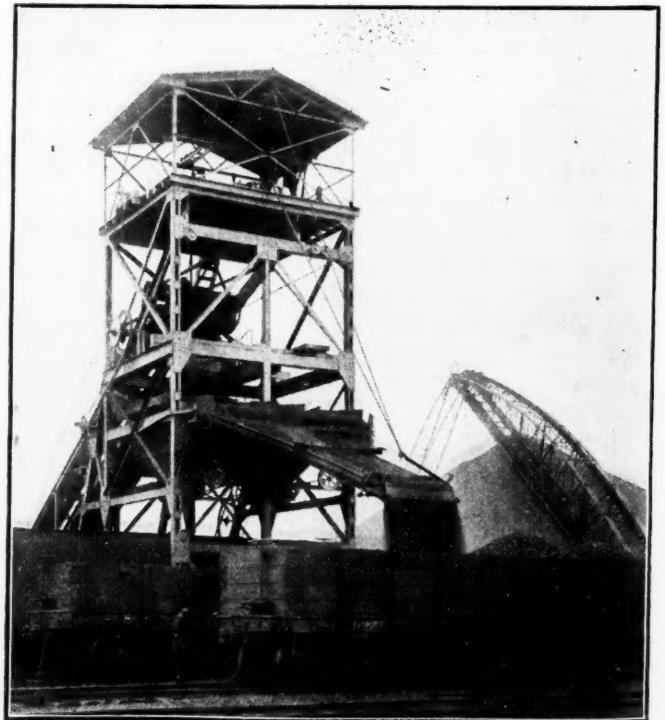


FIG. 4. DISCHARGE FROM CONICAL SYSTEM TO RAILROAD CARS

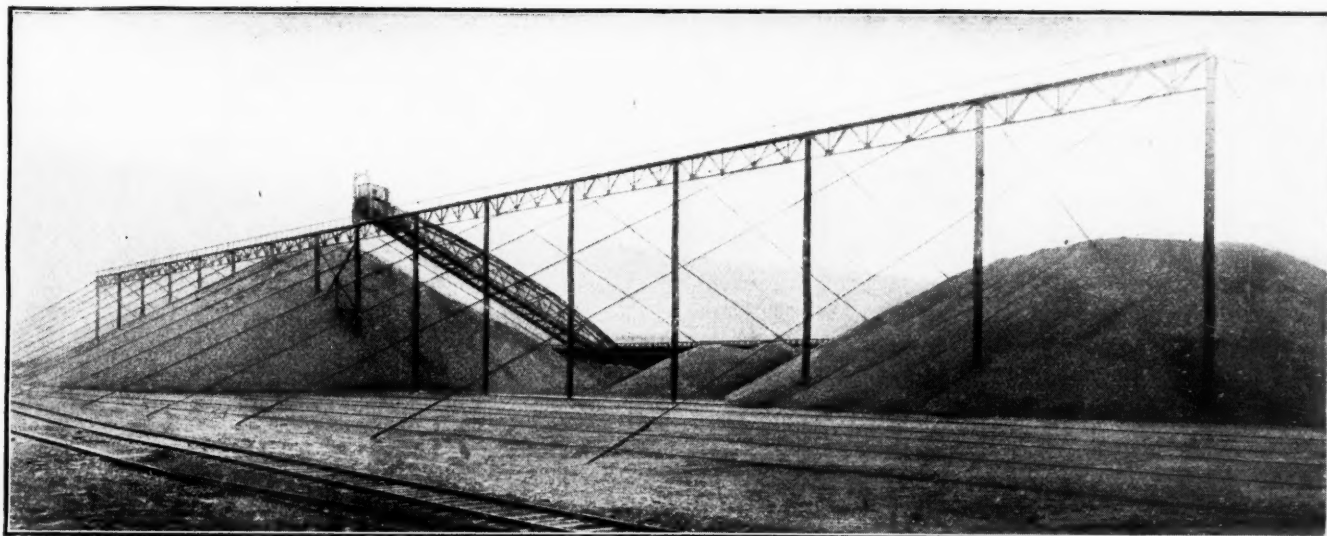


FIG. 5. THE RECTANGULAR SYSTEM OF STORAGE PILING

three to four times faster with the conical pile than with the rectangular.

B. In the conical system each size of coal is separate and can be handled with equal convenience, while in the continuous or rectangular plant the coal must be mixed at the junction to get full capacity.

C. With the conical system no planning is required for placing the coal at the proper location, while considerable foresight must be exercised for the rectangular storage.

D. The conical storage presents mechanical advantages, such as that no structural steel is in contact with the coal; there is no machinery in tunnels under the storage; and the danger of coal avalanching against the runway columns is eliminated.

E. The conical system requires longer tracking space for both empty and full cars for the same storage capacity.

F. For extending the tonnage of the rectangular storage, little additional expense is involved; the run-

way, storage space and tunnel conveyors are the items which must be extended.

G. The operating expense of a conical system is higher than that of the rectangular system. In the latter a goodly portion of the coal which is reclaimed flows to the tunnel conveyor by gravity, and the number of conveying units for both stocking out and reclaiming is less.

Most of the large anthracite coal-storage plants which have been erected in the last ten years or more are of the conical type. The greater capacity and flexibility of this storage system warrants the extra expenditure in the initial cost.

BITUMINOUS COAL STORAGE

For storing bituminous coal, many different kinds of apparatus are used, the type to be chosen depending largely upon the location, the method of receiving coal, the ground space available, etc. It must always be borne in mind that the height of the pile is limited, and



FIG. 6. A HILLSIDE COAL-STORAGE PLANT

for first-class storage installation the machinery must be such that the coal can always be reached under any and all conditions.

A simple and flexible method of stocking bituminous coal for inland storage is with a long-radius locomotive crane traveling on a circular track. The coal is discharged to a hopper and is then taken by the crane bucket to the storage pile immediately adjacent to the circular track.

Cranes for this purpose have been made with 80-, 100- or 110-ft. radius booms, and the coal is usually piled about 25 ft. high. This system is the simplest kind of storage for large quantities of bituminous coal and combines low initial cost with low expense of operating. Often more than one circular pile is made by a single crane, and the storage can be indefinitely increased by adding more trackage and hoppers.

The large capacity in tons per hour of the circular system is made possible because the tracks are so located that the crane bucket can always be brought over the track hopper without making the crane travel. The traversing speed of all cranes is slow, and the movement in this direction should be avoided as much as possible. The circular storage is designed to minimize the travel of the crane and to utilize its slewing or rotating action. The covering up of the circular tracks with coal gives a maximum capacity for a given area and height of pile, but if this is resorted to some of the coal is out of reach of the crane, and this feature is not to be recommended.

Bridge tramways are usually employed where the coal is unloaded from vessels, but the same apparatus can be used to unload from a central railroad hopper. Four electrically operated bridge tramways for handling bituminous coal on a dock are shown in Fig. 7. Each of these has a clear span of 295 ft. and an overall length of 506 ft. Two of the bridges are equipped with 3-ton buckets and two with 4-ton buckets. The run-of-mine bituminous coal is unloaded from vessels and delivered either to storage or through a reloading hopper at the front of the tower of the tramway, to the box or open cars for reshipment. Reclaiming the coal from the stock pile to the cars is accomplished by similar bucket delivery to the reloading hopper. The coal in storage here has been piled as high as 45 ft., but it is not allowed to remain stationary for any length of time.

Fig. 8 shows a bridge tramway arranged so that the bridge can swing over a circular area, thereby commanding a large storage space. This kind of storage can be effected on any fairly level piece of ground having railroad connections. Loaded cars discharge into a track hopper located at the center of rotation, and the

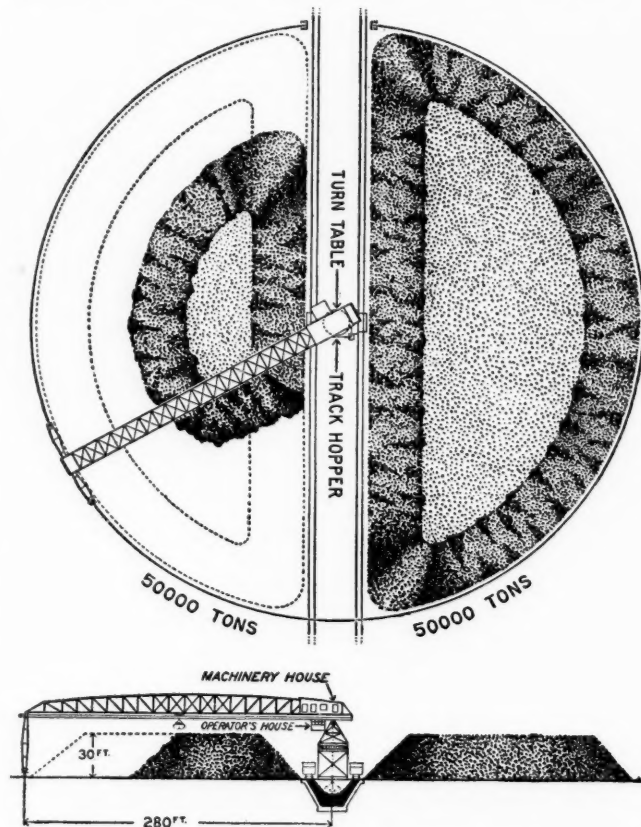


FIG. 8. DIAGRAM OF SWINGING BRIDGE COAL STORAGE

coal is taken therefrom by means of a clamshell bucket and discharged to the storage area. The capacity of the pile so formed is limited only by the span of the bridge and the depth to which the coal can be safely piled.

The labor cost of putting coal into and taking it out of storage has been shown in several instances in normal times to be less than 2c. per ton. With a span of 280 ft., 100,000 tons of coal have been piled, using an arc of swing of the bridge of 340 deg., the coal being

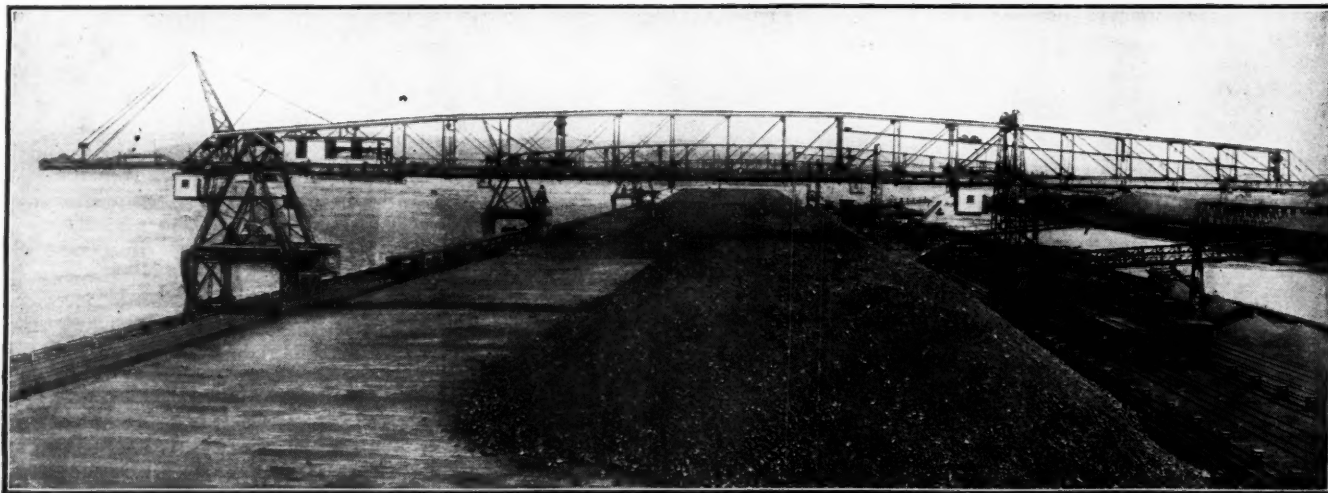


FIG. 7. ELECTRICALLY OPERATED DOCK TRAMWAYS FOR STOCKING AND RECLAIMING COAL

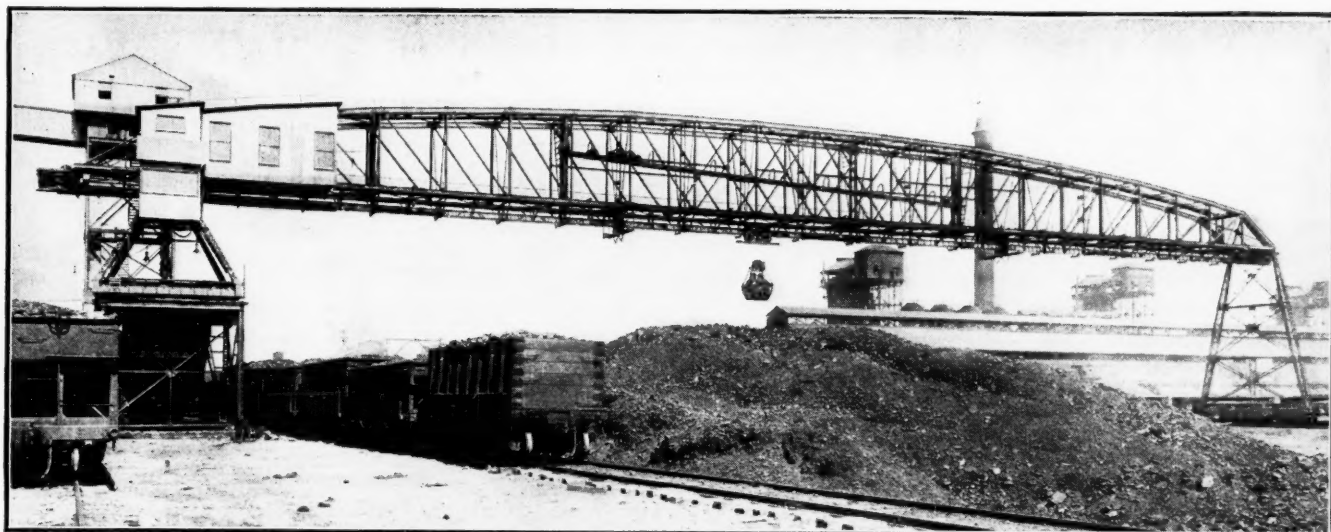


FIG. 12. GENERAL VIEW OF SWINGING BRIDGE STORAGE PLANT

piled 30 ft. deep. All of the coal in this system is tributary to the bucket and can be taken from one point in the storage area to another, or directly to the hoppers or cars.

In still another system of storage coal is unloaded from boats or barges by means of unloading towers, bridge tramways or locomotive cranes, and then delivered to a cable-car system, which discharges the coal in the storage space beneath the trestle. From this point the coal is picked up by long-radius cranes similar to those referred to above. Coal is reclaimed from the storage by these cranes and delivered to a traveling hopper on the car trestle, and thus returned to the cars of the cable system. The coal from the cable system is reloaded either direct to railroad cars or to barges for reshipment.

For a coal storage plant of any kind, whether large or small, the local conditions and requirements must be studied. Each installation presents problems which should be carefully weighed and considered before the method of handling and storing is finally decided upon. It will be found economical to consult an expert in such installations, as it is only by long experience and careful study of problems of this kind that the best arrangement can be secured.

What Constitutes "Storage" of Coal?

BY A. L. H. STREET

Attorney at Law, Minneapolis, Minn.

It was recently unsuccessfully sought to bring a coal dealer under the New York Compensation Act, so as to fix liability to the dependent and surviving relatives of an employee who was fatally injured while trimming coal in a storage pocket, on the theory that the dealer was engaged in an industry covered by group 29 of section 2 of the act, "storage of all kinds." (In re Roberto, 167 New York Supplement, 397.)

Apparently, there was no negligence attributable to the employer in this case, and claimant sought an award under the Compensation Act, which creates a limited liability for accidents arising in the course of employment in the industries covered by the law. The Industrial Commission allowed an award on the theory

that a dealer in coal bought and held for resale must be deemed to be engaged in "storage." In reversing the Commission's decision, the Appellate Division of the New York Supreme Court said:

"I am unable to see how this award can be sustained, unless we are prepared to hold that every merchant and country storekeeper in carrying his ordinary supply and stock of goods is engaged in the storage business. . . . It is true that the employer was conducting a large and extensive business, but it is not the size or magnitude of the business which is controlling, but the manner in which it is conducted. The method pursued by this coal dealer was precisely that which exists in the ordinary coal yards of the cities and villages of the state. If a merchant purchases a stock of goods in excess of his immediate requirements and holds the same for an advance in price, or for any reason does not expose or offer the same for immediate sale, he perhaps to that extent engages in the storage business within the meaning of group 29. But if his stock of goods is on hand for present sale, I cannot think that such stock of goods is being stored merely because the thrift and prudence of the merchant prompts him to have on hand a sufficient supply to meet the most pressing demands which may be made. In this case it has been found that if the market was right the employer 'would store in the summer coal for their winter supply, which coal would be sold in winter.' Perhaps to that extent and in that respect the employer was engaged in storage within the meaning of group 29. But that need not be determined, because it has no application or relation to this accident. . . . There can be no contention that the employer at that time was carrying a larger supply than the immediate demands and requirements of the business made appropriate. There was not on hand a single pound of coal which the employer would not have sold at any moment to any customer in the usual course of business.

DURING 1911, with a production of 500,000,000 tons of coal, there was wasted or left underground in such a condition that it will probably not be recovered 250,000,000 tons of coal. This coal could be partly or wholly saved by more careful mining methods or preparation.

Why and Wherefore of the Coal Shortage*

By J. D. A. MORROW

General Secretary, National Coal Association

THERE is an old saying that if you want to be popular, you shouldn't tell your troubles to people.

I have the highest respect for that ancient dictum, but we all of us recognize the fact that there is a serious situation in respect to coal in this country today, and it appeals to me that it is a situation in which the people generally are entitled to know about the facts. So I hope you will take what I say not as an evidence of an effort to tell you the troubles that are burdening the coal industry today, but as a word of explanation, giving you an understanding of the causes of your difficulty in getting any coal at times and at other times in getting the particular coal that you need.

I want to read first, as a sort of introduction to what I have to say, a few telegrams that I have here. The first one is from Kansas City:

Twelve companies report 225 cars short today. Seventy-five hundred and fifty tons' loss. Thirteen mines are idle all day, four idle part of the day. This shortage situation is not improving.

Here is a telegram from Indiana, from the secretary of an association there that embraces the mines in that state:

Car shortage, 141 cars; tons lost, 12,100.

Here is one from Somerset County, Pennsylvania:

Report for 12 companies a total loss of 8500 tons.

Here is one from eastern Ohio, the mines that serve directly the great industrial manufacturing territory of Cleveland, Akron, Youngstown:

Thirty-five mines reported this association with railroad capacity of 722 cars received on Monday, the 10th, only 242 cars, causing a loss of 24,000 tons from these mines alone.

That was on Monday, which normally is the best day in the week; the railroads have had a chance over Sunday to accumulate some cars. On Tuesday a telegram from the secretary of that same association reads like this:

Forty-four mines reported this association with railroad capacity of 956 cars, received Tuesday, the 11th, only 270 cars, causing a loss of 34,300 tons from these mines alone.

Here is one from the Fairmont district of West Virginia; this also relates to Monday, presumably the best day in the week:

Out of a total of 120 mines in Fairmont Clarksburg region, reporting today, 55 of them received nothing in the way of cars and are closed down completely. Total tonnage all mines reporting loss today amounts to 33,600 tons.

Here is a telegram received last night, the same territory, Clarksburg, Fairmont, West Virginia:

Out of a total of 121 mines in Fairmont, Clarksburg region, reporting today, 49 of them received nothing in the way of cars and are closed down completely for today. All mines reporting today will close, a total of 33,700 tons' loss because of car shortage and car space.

Here is a telegram from the Pittsburgh district:

Ten hundred seventy-two cars short. Reduction below capacity, 53,700 tons.

Here is a telegram from the Pittsburgh district the following day:

Nine hundred cars short. Reduction below capacity, 40,250 tons. No improvement.

That gives you an index of the conditions that the coal operators face in their efforts to produce coal to supply the domestic and industrial needs of this country. It goes without saying that a condition of that kind cannot be permitted to continue. The National Coal Association Committee on Transportation went to the Fuel Administrator the day before Thanksgiving and laid the situation frankly and fully before him and said:

The time has come for action. We have talked with one body after another in Washington for six weeks, and we have got nothing but courteous conversation in response; we need something more than that.

Dr. Garfield had been laboring with the same situation in the same way that we had, and he also had been receiving the same kind of responses, perhaps a little more courteous, but not any more effectual in relieving the situation. On that day he wrote a letter to the Chairman of the Committee of Priority, asking for preference in the supply and priority in the movement of cars for coal and coke. No order was issued in response to that letter. No order went into effect until yesterday. At that time Priority Order No. 5, issued by authority of Judge Lovett, did become effective, and that order in plain, unvarnished English is a gold brick. It does not add one car to the supply, nor will it add one car per day to the movement of coal cars. It does nothing, speaking practically, now except to define the situation that has existed for weeks. It makes no change whatever in the situation.

Here are the telegrams setting forth the conditions that must be remedied if mills and factories in this country are to run, if guns and shells and munitions and ships are to be turned out, if houses are to be kept warm. Why, at the first of this week, in the City of Detroit, wealthy people were going around with buckets and wheelbarrows to get a few pounds of coal. It wasn't a question of tons in Detroit, it had got down to pounds. You will have that same situation in other cities if this sort of thing isn't stopped. The coal operators have done all they can do, the Fuel Administrator has done all that he can do, it takes frank recognition of the situation and it takes decisive and immediate action. Otherwise we will have a coal shortage in this

***T**HE primary cause of the coal shortage is transportation, or, rather, the lack of it. It is a long-standing trouble. We have lived with it now for a year. It has been taken up by coal men with railroad operators within that time quite frequently, within the last three or four months almost weekly. The gravity of the situation has been presented in every angle that a coal man could think of to present it. But to date there has not been any effective action to relieve the situation; instead, it is hourly growing worse.*

*An address delivered before the Editorial Conference, Washington, D. C., Dec. 13, 1917.

country that is not a coal shortage in the sense that we have ever had it before. We will have people freezing to death because they can't get coal within thirty and forty miles and fifty miles of the mines. There is no excuse, gentlemen, for that sort of thing.

Now, what I say may be interpreted in a certain sense as criticism. If so, you may take it in just that sense. These are simply the facts that we are trying to put before you. We don't wish to appear in the light of criticizing the railroads—we know they have had their troubles, enormous burdens, they have done a great deal in trying to measure up to that situation—but in the classic order of George Monroe, be that as it may, they have failed to measure up to the situation. I think it is perhaps due in part to traditional railroading. Let me define what I mean by "traditional railroading."

Heretofore there has always been an abundance of coal, there has been plenty of coal under movement. Accordingly, operating officials of railroads have got into the habit of giving cars to everybody else first, before they were given to the mines, and have moved everything else on the road before they moved coal. One day this summer, in the Conway yards of the

Pennsylvania Railroad of Pittsburgh, there were 343 cars of coal loaded, classified, ready to move to Cleveland and Ashtabula. It was all slack coal. On Monday afternoon, 48 hours later, there were 337 of those same cars standing right there in that yard. Now, that didn't mean that nothing had moved between Pittsburgh and Cleveland and the Lake Front, thousands of tons of freight had moved between Pittsburgh and the Lake Front, but no coal had been moved. Everything else had been moved except coal.

We have tried to say to these railroad men for weeks—for months, in fact—"You can't treat coal that way and get by this winter." But they wouldn't wake up to the fact that we were telling them the truth. They seemed insensible of the change in conditions. Possibly they couldn't do any better than they did, but if so, I submit to you that someone else must do better than they have done.

These are the salient facts of the coal situation today as I have given them to you. The coal operator and the Fuel Administrator are doing all they can to relieve the situation. They need your assistance and your understanding of the situation, your pressure for decisive and effective action.

Mr. Morrow Discusses Several Features of the Coal Situation

Question—I'd like to ask just a little more information about Priority Order No. 5.

Answer—Priority Order No. 5 sets up several different classes of commodities which are to receive preference in supply and in movement. First at the head of the list is railroad fuel. As I said, this order did not change the existing condition, it merely defined it. Railroad fuel comes No. 1 on the list. Doubtless that's all right—I am not quarreling with that at all; the railroads have always furnished cars first to the mines that were to be used in loading railroad coal. If the railroads don't have coal, nothing else will get coal, nothing else can move. That portion of the existing situation is, therefore, defined.

Then you have, following down the list of priority, perhaps not in the exact order I mention, but this will serve as an indication, coal for byproduct plants, etc.; you have coal for munitions plants and companies making supplies for the Government, billed direct to the Government agencies. All those preferences must be O. K'd by agents of the War and Navy Departments. Then you have Government supplies for the Allies, which are billed not directly to the United States Government, but to concerns that are manufacturing or handling goods for the Government. There again that priority order must be O. K'd by the departments down here. And down fifth in the list I found coal for domestic purposes. You find coal for ordinary industrial use put in along with a great number of other commodities which are the commodities that already have had preference on the railroads because of the blue envelopes, because they were already preferred classes of freight, and for other classification reasons. Coal comes in that category, and even there doesn't receive any additional preference in cars. It gets their only preference in movement, and gets it along with all these other commodities that have all the time enjoyed it.

We figured this thing out; we took the classification commodities on the railroads and compared them with the commodities listed in Judge Lovett's order, and found that it covered 85 per cent. of the freight that moves, that the railroads are now conducting 85 per cent. of the freight they are handling, or are attempting to handle, and it is very useless, under conditions of this kind, to undertake to get the preference for coal out of a situation of that kind, that we must have.

Now, there is no material change in that situation except that it is nailed down hard and fast to priority or to No. 5.

There have been some improvements in this respect. Those blue envelopes that were handed out some time ago so generously down here were one of the causes of the transportation tieup on a lot of railroads. That was one of the faults that the Coal Association took exception to. They insisted that there must be a change in that, and I am glad to say that the celebrated No. 22, which made it possible for the Army Department and for clerks in various other departments just to hand out these blue envelopes indiscriminately, has been withdrawn, and in place of it, another has been issued saying that preference of that kind can still be obtained, but it must be sanctioned by some one responsible official in these different departments. It is operated now on that basis. But this change in the physical conditions of the operation of the roads has taken place in the meantime. We kept saying over and over to the roads: "You are operating now under almost ideal weather conditions" (October and November were splendid), "some day a blizzard will hit you people and the thermometer will go down and your operating efficiency will drop over 20 per cent." It has dropped.

There has been no change in this preference or priority which even begins to make up for that 20 per cent. of loss of efficiency. That's the situation that we are facing right now.

Question—I'd like to ask Mr. Morrow just what he meant when he said the time has come for action. Do you mean that a new priority order—I mean, can relief be brought about through existing conditions?

Answer—Yes; it can. If you would give for a brief period of time in a year, priority of movement to the coal that is now standing under load, just simply say this to the operating officials of your railroads—and Judge Lovett has the authority to say it—"Move coal, and do that for three, four or five or six days," you would relieve the immediate pressure for coal. Then give these mines a preference in the supply of cars for 30 days and conditions would be righted. The coal mines today normally require about 350,000 cars, open-top cars; there are some box cars, they load quite a little coal in box cars—we will say 350,000 railroad cars altogether. There must be an increase of about 20 per cent. in that number of cars for a short time to tide us over the immediate difficulty. Now, if 70,000 additional cars are put into this business, in the coal business, it would restrict the movement of freight in other lines, it would restrict the car supply to those other lines. But, gentlemen, I submit

that you had better have the restriction. If that doesn't happen, mills and furnaces will be restricted anyway, because they will not have coal to run with. Now, you can take your choice; you can shut down your plants because you haven't got coal, or you can curtail your production because you haven't got quite enough railroad cars. But you will be able to run at that curtailed figure for a time, and we will get past the immediate crisis, for that is exactly what it is. Now, that is the thing that I meant when I said "immediate, decisive action" could be taken that would relieve this situation. We have asked for that thing, and we need your help in getting it.

Question—Are there sufficient cars for the handling of coal while those cars are kept in motion, or is there an actual shortage of cars so far as mines are concerned?

Answer—Primarily, it is a difficulty of movement. If the movement of coal were speeded up, it would very materially help the supply of cars, but it would be necessary in a brief time to have an added supply of cars for the mines. There are approximately—I may be a little wrong on figures—1,000,000 open-top cars in this country. And, as I said a moment ago, something like 350,000 of those cars would be in the coal business. That leaves a pretty good percentage of cars for other business, and if you took out 70,000 there would still be quite a supply of cars available for other business.

Understand, it is primarily right now difficulty in movement. The roads are not able to get their freight through. Why, passenger trains are coming in here anywhere from four to five hours late. When that is so, what do you suppose is happening to freight trains?

Now, the roads are having plenty of trouble with their engines—something that they are not responsible for. Their shop repairmen have been drafted in large numbers, so that they have not been able to keep up the efficiency of their operating equipment as heretofore. That has been one of their troubles that they have not been able to overcome.

NOT ENOUGH LOCOMOTIVES TO MEET DEMAND

Another thing that is causing trouble (we might just as well talk frankly here) is the fact that a large part of the output of locomotives has been going abroad. That is very generally known. That has made it extremely difficult for the roads to get the additional equipment that they need, or to replace engines that necessarily have been of old design.

I understand that right now there are locomotives that were built for the Russian Government that are standing here, and nobody knows when they will go to Russia, if ever. Gentlemen, I submit that those locomotives can do a great deal more toward winning the war if used here in the United States instead of in Russia. It would take a long time to build the engines we need on our roads; and I think we need a clear understanding by those who are in authority—not an understanding, but a readiness and willingness to take decisive action. We don't need understanding so much any more; it ought to be clear to everybody by this time. What we need is action.

Question—I'd like to ask if the Food Administration got very much relief in the way of extra cars from priority No. 2.

Answer—That's the order that took cars from the road-building material men, and that sort of thing. Theoretically, they ought to have got some cars, but practically the thing worked out just like the pooling has worked out; when the pool was established covering some 20 tons of coal, I remember we sat down to figure out how many railroad cars that would free, would make available, and one of the conditions on which the coal men went into that pool, or they thought it was one of the conditions, was that those extra cars would be kept in the coal business. Well, no doubt the pooling freed the cars, statistics show that, but there isn't a coal man in the territory that supplies the Lakes that could put his finger on any increase in car supply that resulted from it.

Now, when they put in the pools at tidewater ports, the same sort of examination of the situation there indicated a material saving of cars, and doubtless it made a material saving of cars, but that saving was instantly dissipated as far as the coal situation was concerned, because the cars

went into other lines of business on account of the distribution. If you will pardon a minute's digression there, let me explain what I mean by that.

Coal men have a fixed rate. You operate a coal mine and an agent of the railroad will inspect that mine and decide that it is capable of producing, say, a thousand tons a day. In other words, that mine is given a rating of 20 cars a day. Other mines are rated in a similar way. In general, I think the rating is fair. We don't particularly quarrel about that. There is no effort on the part of the railroads at all to discriminate or confuse that rate, but the fact remains that a rating is fixed. Now, in times of car shortage, cars are distributed to coal mines on a percentage basis, a percentage of your rating is furnished you. If your mine is rated at 20 cars, and you take a division that may require 2500 cars to furnish the mines on that line with sufficient equipment for a day, if there are only 1500 open-top cars available for distribution to those mines, the mines would get what is known as a 60 per cent. car supply. That is, they would get 60 per cent. of the mine rating; and a mine rated at 20 cars would get 12 cars, and all the others would get cars in the same proportion. Now, that limits strictly the number of cars that can come into the coal business. On the other hand, the number of cars that go to industrial plants is not so limited. Theoretically it may be, but practically it is not. Those plants do not have a rating fixed as the coal mines do. They order cars, and the order is the thing that is discounted; and the alert traffic manager merely increases the order when he knows there is a shortage. Many of those plants, too, are located on more than one railroad. That means that in time of shortage of cars they can get cars from both roads, so that in general the industrial plants are able to take care of these shortages of cars better than the mines. So that while order No. 2 has freed cars in the mining districts, they have very soon got out into other lines, because of the operation of those things.

In Lighter Vein

ATTENTION OF DR. GARFIELD

A proprietor of a steam laundry in Louisville, Ky., boasted the other day of how he had robbed the coal shortage of its terrors. It was during the period of zero weather and deep snow and gas failure in Louisville, when almost everybody wanted coal at one time. Everything that could haul coal was pressed into service. Many families warmed their homes by coal taken there by basket, bag and automobile. Coal-laden mule-drawn wagons were to be seen on every street headed for somebody's empty coal shed. Many of them went past the laundryman's coal-less place before he achieved the idea. Then he acted. He took a post at the window. Presently laboring mules pulled a ton and a half of coal into sight. He rushed out and flagged the negro:

"I've got 50c. and a big drink of whisky for you," he said, "if you drive into my alley and dump that coal into my bin."

"Like to, boss," said the negro, "but I dassen't."

So the laundryman explained that all the colored man had to do was to go to the telephone, call up the coal man's office and explain that his mules were plumb beat out and couldn't go a step farther, and to wind up by saying: "There's a fellow here says he'll take the coal."

It was a measly thing to do, of course, but it worked; not once, but many times, and it worked with friends of the laundryman to whom he passed the tip. "Fifty cents and a drink of whisky" on a zero day is almost all a negro coal-wagon driver wants to hear about.

Anthracite Coal Stripping—II

By THOMAS F. KENNEDY

Scranton, Pennsylvania

SYNOPSIS—After the proposed stripping area has been thoroughly prospected, the economic stripping limits must be determined. The economic ratio of overburden to coal may be calculated from the cost per cubic yard of excavating the overburden, the market price of the coal per ton, the desired margin of profit per ton of coal and the cost per ton of mining and preparation.

AFTER the prospecting question has been thoroughly studied, the next important step in the stripping problem is the determination of the economic stripping limit. A preliminary general study of the problem should be made by the transitman in charge of the survey of the proposed stripping area. This survey should include the location of boreholes, cut stones and property lines, fence lines, tracks, waterways, probable dumping areas for overburden and all topographical features hinging upon the stripping.

If the surface of the prospected area has a uniform contour and holes are drilled approximately every 50 ft., elevations on each hole should suffice for the calculation of the quantities; otherwise, in addition to the elevation on each borehole, the area should be cross-sectioned every 50 ft. From the field notes taken, the survey is then plotted. For quantity calculation purposes the scale of the plan should be either 1 in. = 25 ft. or 1 in. = 50 ft., the choice of the scale depending upon the extent of the stripping area. Alongside of each borehole plotted, the section of that borehole should be shown. Cross-sections plotted to a scale of 1 in. = 10 ft. show the characteristics of the overburden and the coal measures. These sections enable the engineer to study the problem more thoroughly. After a careful study of the borehole sections, the approximate outcrop of the coal bed is then delineated upon the plan.

TO DEFINE ECONOMIC STRIPPING LIMIT

The question of establishing the economic stripping limit is next in order. To determine this limit no well-defined rule can be followed, because each stripping proposition has its own characteristics. The most important factors affecting the limit are the margin of profit, quantity of coal, character of overburden (whether clay or rock), transportation and preparation of coal and disposal of overburden, methods of mining the coal and removing the overburden, interest on capital invested and depreciation of plant, labor conditions and engineering services. From an approximate calculation of the quantities of overburden and coal, the engineer, after studying the foregoing factors, decides what would be reasonable costs per cubic yard for excavation of overburden and mining and preparation of coal per ton. Knowing the market price of coal and the desired margin of profit, the ratio of over-

burden in cubic yards to one ton of coal can be determined from the following equation:

$$X = \frac{A - B - C}{D}$$

in which

X = Number of cubic yards of overburden to one ton of coal;

D = Cost of excavating 1 cu.yd. of overburden;

A = Market price of coal per ton;

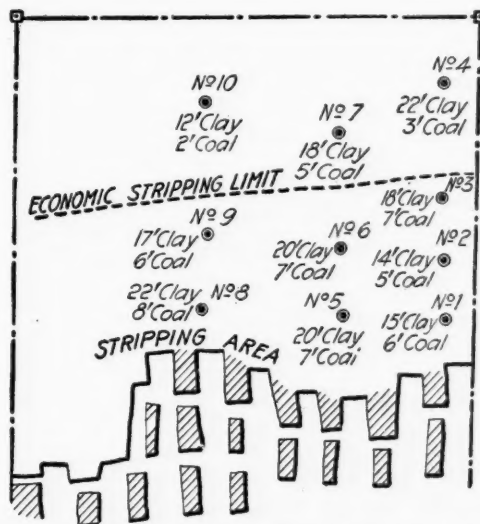
B = Margin of profit per ton of coal;

C = Cost of mining and preparation per ton.

The market price used in the above equation may be the operator's price direct to the consumer or the retailer. Another factor that may enter into the equation is the transportation or freight charges and other incidental expenses.

It can be seen that the ratio of overburden to coal depends primarily upon the market price, margin of profit, the cost of mining and preparation of one ton of coal and finally the cost of removing one cubic yard of overburden. With the overburden to coal ratio known, the question of defining the economic stripping limit is in order.

In determining the economic stripping limit, I have compiled the accompanying overburden-coal ratio table



PLAN SHOWING PROSPECTIVE STRIPPING AREA

for the various thicknesses of overburden and coal. The table is based upon the principle that one long ton of coal (sp.gr. = 1.378) in the solid, contains approximately 0.96 cu.yd., or by removing equal volumes of overburden and coal, it is necessary to remove 0.96 cu.yd. of overburden for one ton of coal. Considering then the thicknesses of overburden and coal equal to one foot for equal volumes, the ratio of overburden in cubic yards to one ton of coal is 0.96.

By studying the table, it can be seen that for a constant thickness of overburden and a variable thickness of coal the ratio is inversely proportional to the

thickness of the coal, while for a constant coal thickness and a variable depth of overburden the ratio is directly proportional to the overburden thickness. The figures in the left column show the overburden thicknesses in feet, while the top row shows the coal thicknesses in feet. The remaining figures show the overburden-coal ratio of the number of cubic yards of overburden to one long ton of coal.

The table is compiled for coal thicknesses of from 1 to 15 ft., overburden thicknesses of 1 to 65 ft. and

sumed. It will be assumed further that it is profitable to remove 3 cu.yd. of overburden to extract one ton of coal. The overburden coal ratio is thus 3 to 1. The plan on the preceding page shows the prospected area of a stripping under consideration.

Referring to the plan, No. 1 borehole shows 15 ft. of overburden and 6 ft. of coal. With a ratio of 3 to 1 and a coal thickness of 6 ft., the table shows that it is profitable to remove any overburden of a thickness up to and including 19 ft. No. 2 borehole shows

OVERBURDEN-COAL RATIO TABLE FOR DETERMINATION OF ECONOMIC STRIPPING LIMIT

Overburden Thickness, Feet	Coal Thickness—Feet														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.96	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	1.9	0.96	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
3	2.9	1.4	0.96	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
4	3.8	1.9	1.3	0.96	0.8	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3
5	4.8	2.4	1.6	1.2	0.95	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4
6	5.8	2.9	1.9	1.4	1.1	0.96	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5
7	6.7	3.4	2.2	1.7	1.3	1.1	0.98	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6
8	7.7	3.8	2.6	1.9	1.5	1.3	1.1	0.96	0.9	0.8	0.7	0.7	0.7	0.7	0.7
9	8.6	4.3	2.9	2.2	1.7	1.4	1.3	1.1	0.99	0.9	0.8	0.8	0.8	0.8	0.8
10	9.6	4.8	3.2	2.4	1.9	1.6	1.4	1.2	1.1	0.96	0.9	0.9	0.9	0.9	0.9
11		5.3	3.5	2.6	2.1	1.8	1.5	1.3	1.2	1.1	0.96	0.9	0.9	0.9	0.9
12		5.8	3.8	2.9	2.3	1.9	1.7	1.4	1.3	1.2	1.0	0.96	0.9	0.9	0.9
13		6.2	4.2	3.1	2.5	2.1	1.8	1.6	1.4	1.2	1.1	1.0	0.96	0.9	0.9
14			4.5	3.4	2.7	2.2	2.0	1.7	1.5	1.3	1.2	1.1	1.0	0.97	0.9
15			4.8	3.6	2.9	2.4	2.1	1.8	1.7	1.4	1.3	1.2	1.1	1.0	0.96
16			5.1	3.8	3.0	2.6	2.2	1.9	1.8	1.5	1.4	1.3	1.2	1.1	1.0
17			5.4	4.1	3.2	2.7	2.4	2.0	1.9	1.6	1.5	1.4	1.3	1.2	1.1
18			5.8	4.3	3.4	2.9	2.5	2.2	2.0	1.7	1.6	1.4	1.3	1.2	1.2
19			6.1	4.6	3.6	3.0	2.7	2.3	2.1	1.8	1.7	1.5	1.4	1.3	1.2
20				4.8	3.8	3.2	2.8	2.4	2.2	1.9	1.7	1.6	1.5	1.4	1.3
21				5.0	4.0	3.4	2.9	2.5	2.3	2.0	1.8	1.7	1.6	1.5	1.4
22				5.3	4.2	3.5	3.1	2.6	2.4	2.1	1.9	1.8	1.6	1.5	1.4
23					4.4	3.7	3.2	2.8	2.5	2.2	2.0	1.8	1.7	1.6	1.5
24					4.6	3.8	3.4	2.9	2.6	2.3	2.1	1.9	1.8	1.7	1.5
25					4.8	4.0	3.5	3.0	2.8	2.4	2.2	2.0	1.9	1.7	1.7
26					4.9	4.2	3.6	3.1	2.9	2.5	2.3	2.1	1.9	1.8	1.7
27					5.1	4.3	3.8	3.2	3.0	2.6	2.3	2.2	2.0	1.9	1.7
28						4.5	3.9	3.4	3.1	2.7	2.4	2.2	2.1	1.9	1.8
29						4.6	4.1	3.5	3.2	2.8	2.5	2.3	2.1	2.0	1.8
30						4.8	4.2	3.6	3.3	2.9	2.6	2.4	2.2	2.1	1.9
31						5.0	4.3	3.7	3.4	3.0	2.7	2.5	2.3	2.1	2.0
32						5.1	4.5	3.8	3.5	3.1	2.8	2.6	2.4	2.2	2.0
33							4.6	4.0	3.6	3.2	2.9	2.6	2.4	2.3	2.1
34							4.8	4.1	3.7	3.3	3.0	2.7	2.5	2.3	2.2
35							5.0	4.2	3.9	3.4	3.0	2.8	2.6	2.4	2.2
36							5.0	4.3	4.0	3.5	3.1	2.9	2.7	2.5	2.3
37								4.4	4.1	3.6	3.2	3.0	2.7	2.6	2.4
38								4.6	4.2	3.6	3.3	3.0	2.8	2.6	2.4
39								4.7	4.3	3.7	3.4	3.1	2.9	2.7	2.5
40								4.8	4.4	3.8	3.5	3.2	3.0	2.8	2.6
41								4.9	4.5	3.9	3.6	3.3	3.0	2.8	2.6
42								5.0	4.6	4.0	3.7	3.4	3.1	2.9	2.7
43									4.7	4.1	3.7	3.4	3.2	3.0	2.8
44									4.8	4.2	3.8	3.5	3.3	3.0	2.8
45									5.0	4.3	3.9	3.6	3.3	3.1	2.9
46										4.4	4.0	3.7	3.4	3.2	2.9
47										4.5	4.1	3.8	3.5	3.2	3.0
48										4.6	4.2	3.8	3.6	3.3	3.1
49										4.7	4.3	3.9	3.6	3.4	3.1
50										4.8	4.4	4.0	3.7	3.5	3.2
51										4.9	4.4	4.1	3.8	3.5	3.2
52										5.0	4.5	4.2	3.8	3.6	3.3
53											4.6	4.2	3.9	3.7	3.4
54											4.7	4.3	4.0	3.7	3.5
55											4.8	4.4	4.1	3.8	3.5
56											4.9	4.5	4.1	3.9	3.6
57											5.0	4.6	4.2	3.9	3.6
58												4.6	4.3	4.0	3.7
59												4.7	4.4	4.1	3.8
60												4.8	4.5	4.2	3.9
61												5.0	4.6	4.3	4.0
62													4.7	4.3	4.0
63													4.8	4.4	4.1
64														4.5	4.2
65															

Sp.Gr. Coal = 1.378.

ratios of 5 to 1 for coal thicknesses of 1 to 12 ft. and 4 to 1 for remaining coal thicknesses. From the foregoing principle, the table may be worked out for any desired coal and overburden thicknesses or ratio.

For any other specific gravity this table of ratios may be used by applying the ratio of the new specific gravity to the one used in the table. The greater specific gravity gives a greater ratio, while a smaller one gives a smaller ratio.

To show the application of the table, a problem in determining the economic stripping limit will be as-

sumed. It will be assumed further that it is profitable to remove 3 cu.yd. of overburden to extract one ton of coal. The overburden coal ratio is thus 3 to 1. The plan on the preceding page shows the prospected area of a stripping under consideration. Referring to the plan, No. 1 borehole shows 15 ft. of overburden and 6 ft. of coal. With a ratio of 3 to 1 and a coal thickness of 6 ft., the table shows that it is profitable to remove any overburden of a thickness up to and including 19 ft. No. 2 borehole shows 5 ft. of coal and 14 ft. of overburden, so that with a ratio of 3 to 1, the table shows that it is profitable to remove overburden up to and including 16 ft. No. 3 borehole has 7 ft. of coal and 18 ft. of overburden, so that 21 ft. of overburden might be removed profitably. No. 4 borehole has 3 ft. of coal and 22 ft. of overburden, but the table shows that with a ratio of 3 to 1 only 9 ft. of overburden can be stripped profitably. The economic stripping limit then lies somewhere between No. 3 and No. 4 boreholes. This limit is found by interpolating as follows:

There are differences of 4 ft. of coal thickness between No. 3 and No. 4 boreholes and an overburden thickness of 4 ft. It is assumed that the coal thins out gradually from borehole No. 3 to borehole No. 4 and likewise the thickness of the overburden increases gradually. By interpolation midway between the boreholes, there are thicknesses of 20 ft. of overburden and 5 ft. of coal, so that with the ratio of 3 to 1, the table shows that only 16 ft. of overburden can be removed profitably. Again, by interpolation, one-fourth the distance between the boreholes, there are thicknesses of 19 ft. of overburden and 6 ft. of coal, and the table shows that 19 ft. of overburden can be removed profitably to mine the 6 ft. of coal, so that the one-fourth point between the boreholes locates the economic stripping limit. The same principle is followed out in locating other points upon the stripping limit line.

In determining the location of the stripping limit, of the overburden, the slope of excavation should be considered. General practice allows $1\frac{1}{2}$ and 2 to 1, slope for clay and sand, and $\frac{1}{2}$ and 1 to 1, slope for solid rock or shale.

(To be continued)

Some Interviews

This One with a Mining Town Parson

On the last day of my campaign for pledges toward the soldiers' Y. M. C. A. fund, I had the most interesting and suggestive interview of the campaign. Could I have had the benefit of it in the beginning of my canvass, my efforts would undoubtedly have borne better fruit.

The speaker was a mining camp preacher whose promised salary was so small that the earnings of his son, a trapper-boy, alone insured credit at the company commissary. As a matter of fact, the parson rarely collected to exceed one-half of the amount promised him by his flock.

Knowing all this, I had decided not to ask him for a pledge; but I ran across him unexpectedly in the timekeeper's office and felt that I might embarrass him if I ignored him in the presence of the timekeeper.

To my question, "Would you like to make a contribution?" he promptly replied, "Most certainly; isn't this my war?"

One remark led to another, until finally he gave me this: "Do you know, I believe that we cannot win this war until every last man realizes that this war is a personal matter and that as such it requires maximum personal effort; by effort I do not necessarily mean sacrifice.

"Ask the next man that you meet to tell you what he has done to help win the war, and you are more than apt to embarrass him; he may not be a slacker, slackers are not in the majority by any manner of means, but somehow he doesn't seem to understand that the things that he might do could affect the result of the conflict. 'What possible effect could one or two more tons of coal have on the final result, anyway,' he says to himself if he is a coal miner; and men in the other occupations have similar views.

"The inability of the average man to realize the importance of his 'bit' toward the successful conduct of the affairs of his town, his state, his country, and his world, is positively pathetic. Preachers have always realized this, but the war is bringing it home to many other men; before the end it will probably be brought home to all men.

"Take the 'white slave' evil, or the liquor evil, or the curse of grafting politicians, for illustration. How long could any of these things exist if every one opposed to them would make some effort to stamp them out? Ninety per cent. of our population, at least, are bitterly opposed to these things, and that 90 per cent. could easily stamp them out for all time in a few weeks if they made the effort; still year after year these evils continue to take their frightful toll. Mr. Average Man shrugs his shoulders when he sees them mentioned in his paper and then promptly turns his attention to the next column, and the thing passes from his mind.

"And in that way Mr. Average Man is helping to win this war up to the present time; he pores over the press dispatches, sighs, shrugs his shoulders, and then goes about his business.

"I have talked to our mine superintendent, to our office men and to our miners, and they all admit that the war is a terrible thing; still they don't act as if they realized that it is such a terrible thing. Of course, when their sons begin to come back maimed and crippled, while still others go to the land 'from whence no traveler returns,' things will undoubtedly be different; but in the meantime what a price to pay for indifference.

"There is one consolation; think of the kind of government we will have when this war makes everyone realize his personal responsibility toward his city, his state and his country, a thing that teaching and preaching have both failed to do."

Correspondent "Over There" for McGraw-Hill Papers

Robert K. Tomlin, Jr., managing editor of *Engineering News-Record*, sailed recently for France to serve *Engineering News-Record*, and the other papers of the McGraw-Hill Company, Inc., as special correspondent at the front. Mr. Tomlin was graduated from Harvard University in 1907. During his college course he served for two summers as assistant in the surveying and railroad field engineering of the Harvard Engineering Camp at Squam Lake, N. H. After graduation, he entered the employ of the Pennsylvania R.R. on the tunnel work in connection with the Pennsylvania Station in New York City. He left this work to go to the New York Board of Water Supply, and was stationed with the Northern Aqueduct Department at Poughkeepsie, New York.

His journalistic experience dates from March, 1909, when he became assistant to the editor of the *Engineering Record*. He was subsequently made associate editor, in charge of the municipal and sanitary field, and in 1913 was promoted to managing editor. When *Engineering News-Record* was formed last April by the consolidation of *Engineering News* and the *Engineering Record*, Mr. Tomlin was made managing editor.

Wastes of Coal in the United States

AS A means of far-reaching economy, the Government of the United States should at this time apply intelligent and direct-acting efforts to the conservation of fuel at the industrial plants which are responsible for its greatest consumption. It is unnecessary here to show proof that coal is wasted in vast quantities in the boiler furnaces of many plants, to feed which it is mined and distributed at a high and ever-increasing cost of labor and material.

The mining and distribution of coal have been placed under the supervision of the War Coal Board in order more nearly to meet the crying needs in these directions, to use the railroad facilities more efficiently so that the present car shortage may be minimized to the greatest possible extent, and to apportion the coal in quantity and to uses deemed most expedient.

coal while those cars are kept in motion, or is there an actual shortage of cars so far as mines are concerned?

Answer—Primarily, it is a difficulty of movement. If the movement of coal were speeded up, it would very materially help the supply of cars, but it would be necessary in a brief time to have an added supply of cars for the mines. There are approximately—I may be a little wrong on figures—1,000,000 open-top cars in this country. And, as I said a moment ago, something like 350,000 of those cars would be in the coal business. That leaves a pretty good percentage of cars for other business, and if you took out 70,000 there would still be quite a supply of cars available for other business.

Understand, it is primarily right now difficulty in movement. The roads are not able to get their freight through. Why, passenger trains are coming in here anywhere from four to five hours late. When that is so, what do you suppose is happening to freight trains?

Now, the roads are having plenty of trouble with their engines—something that they are not responsible for. Their shop repairmen have been drafted in large numbers, so that they have not been able to keep up the efficiency of their operating equipment as heretofore. That has been one of their troubles that they have not been able to overcome.

NOT ENOUGH LOCOMOTIVES TO MEET DEMAND

Another thing that is causing trouble (we might just as well talk frankly here) is the fact that a large part of the output of locomotives has been going abroad. That is very generally known. That has made it extremely difficult for the roads to get the additional equipment that they need, or to replace engines that necessarily have been of old design.

I understand that right now there are locomotives that were built for the Russian Government that are standing here, and nobody knows when they will go to Russia, if ever. Gentlemen, I submit that those locomotives can do a great deal more toward winning the war if used here in the United States instead of in Russia. It would take a long time to build the engines we need on our roads; and I think we need a clear understanding by those who are in authority—not an understanding, but a readiness and willingness to take decisive action. We don't need understanding so much any more; it ought to be clear to everybody by this time. What we need is action.

Question—I'd like to ask if the Food Administration got very much relief in the way of extra cars from priority No. 2.

Answer—That's the order that took cars from the road-building material men, and that sort of thing. Theoretically, they ought to have got some cars, but practically the thing worked out just like the pooling has worked out; when the pool was established covering some 20 tons of coal, I remember we sat down to figure out how many railroad cars that would free, would make available, and one of the conditions on which the coal men went into that pool, or they thought it was one of the conditions, was that those extra cars would be kept in the coal business. Well, no doubt the pooling freed the cars, statistics show that, but there isn't a coal man in the territory that supplies the Lakes that could put his finger on any increase in car supply that resulted from it.

Now, when they put in the pools at tidewater ports, the same sort of examination of the situation there indicated a material saving of cars, and doubtless it made a material saving of cars, but that saving was instantly dissipated as far as the coal situation was concerned, because the cars

With the hope of quickening the campaign for the conservation of fuel during the war, and in order to get the problem generally before those who are immediately interested, the Bureau of Mines has reproduced an article by David Moffat Myers, member of the American Society of Mechanical Engineers, on "Preventable Waste of Coal in the United States; with a Consideration of Alternative Methods of Its Elimination." This article was presented at the annual meeting of the Society in New York, Dec. 4 to 7, and is here published in part.

more lucrative field for producing economies, and these with a minimum of alteration in physical equipment. Under present conditions a plant which carelessly operates at an efficiency of 40 to 50 per cent. receives from the Government the same consideration in the delivery of coal as the one whose efficiency is 70 to 75 per cent. This obviously is unfair as well as wasteful. The Government hands

over, say, 200,000 tons of coal a year to a plant owner, but asks for no account as regards its consumption, nor any questions as to the amount of steam it is made to produce. There is nevertheless an equivalent amount of steam this fuel is capable of generating, and it can and should be made to produce that quantity.

CONSERVATION METHODS

The object of this paper is to open a discussion which it is hoped will ultimately lead to the formulation of

centage of your rating is furnished you. If your mine is rated at 20 cars, and you take a division that may require 2500 cars to furnish the mines on that line with sufficient equipment for a day, if there are only 1500 open-top cars available for distribution to those mines, the mines would get what is known as a 60 per cent. car supply. That is, they would get 60 per cent. of the mine rating; and a mine rated at 20 cars would get 12 cars, and all the others would get cars in the same proportion. Now, that limits strictly the number of cars that can come into the coal business. On the other hand, the number of cars that go to industrial plants is not so limited. Theoretically it may be, but practically it is not. Those plants do not have a rating fixed as the coal mines do. They order cars, and the order is the thing that is discounted; and the alert traffic manager merely increases the order when he knows there is a shortage. Many of those plants, too, are located on more than one railroad. That means that in time of shortage of cars they can get cars from both roads, so that in general the industrial plants are able to take care of these shortages of cars better than the mines. So that while order No. 2 has freed cars in the mining districts, they have very soon got out into other lines, because of the operation of those things.

In Lighter Vein

ATTENTION OF DR. GARFIELD

A proprietor of a steam laundry in Louisville, Ky., boasted the other day of how he had robbed the coal shortage of its terrors. It was during the period of zero weather and deep snow and gas failure in Louisville, when almost everybody wanted coal at one time. Everything that could haul coal was pressed into service. Many families warmed their homes by coal taken there by basket, bag and automobile. Coal-laden mule-drawn wagons were to be seen on every street headed for somebody's empty coal shed. Many of them went past the laundryman's coal-less place before he achieved the idea. Then he acted. He took a post at the window. Presently laboring mules pulled a ton and a half of coal into sight. He rushed out and flagged the negro:

"I've got 50c. and a big drink of whisky for you," he said, "if you drive into my alley and dump that coal into my bin."

"Like to, boss," said the negro, "but I dassen't."

So the laundryman explained that all the colored man had to do was to go to the telephone, call up the coal man's office and explain that his mules were plumb beat out and couldn't go a step farther, and to wind up by saying: "There's a fellow here says he'll take the coal."

It was a measly thing to do, of course, but it worked; not once, but many times, and it worked with friends of the laundryman to whom he passed the tip. "Fifty cents and a drink of whisky" on a zero day is almost all a negro coal-wagon driver wants to hear about.

water must be taught and information given regarding practical appliances for automatic measurements of both.

Blank forms might be sent in advance to plant owners in order to be advised by them, first, whether they would be willing to coöperate with a governmental organization offering to assist them in reducing their coal consumption, and second, to obtain such data as to size, type, equipment, operation and fuel consumption of the plants as would enable a classification which would permit a Government board of experts to send such instructions as would include the information needed for any one class of plants.

This work would be greatly aided by a staff of experts ready to visit plants when so requested by owners and make investigations and recommendations and keep in touch with the progress of economies. Included in such a staff should be men intimately familiar with practical operating economies whose duties would be the delivering of lectures or talks, which should be planned so as to reach directly not only managers and owners of the industries, but also the chief engineers and firemen of the boiler plants. This feature of the plan, by itself, would undoubtedly result in great savings.

The United States Bureau of Mines has for a number of years engaged in obtaining and disseminating scientific information regarding the mining and consumption of coal and the results of the work have been of great

calculated from the cost per cubic yard of excavating the overburden, the market price of the coal per ton, the desired margin of profit per ton of coal and the cost per ton of mining and preparation.

AFTER the prospecting question has been thoroughly studied, the next important step in the stripping problem is the determination of the economic stripping limit. A preliminary general study of the problem should be made by the transitman in charge of the survey of the proposed stripping area. This survey should include the location of boreholes, cut stones and property lines, fence lines, tracks, waterways, probable dumping areas for overburden and all topographical features hinging upon the stripping.

If the surface of the prospected area has a uniform contour and holes are drilled approximately every 50 ft., elevations on each hole should suffice for the calculation of the quantities; otherwise, in addition to the elevation on each borehole, the area should be cross-sectioned every 50 ft. From the field notes taken, the survey is then plotted. For quantity calculation purposes the scale of the plan should be either 1 in. = 25 ft. or 1 in. = 50 ft., the choice of the scale depending upon the extent of the stripping area. Alongside of each borehole plotted, the section of that borehole should be shown. Cross-sections plotted to a scale of 1 in. = 10 ft. show the characteristics of the overburden and the coal measures. These sections enable the engineer to study the problem more thoroughly. After a careful study of the borehole sections, the approximate outcrop of the coal bed is then delineated upon the plan.

TO DEFINE ECONOMIC STRIPPING LIMIT

The question of establishing the economic stripping limit is next in order. To determine this limit no well-defined rule can be followed, because each stripping proposition has its own characteristics. The most important factors affecting the limit are the margin of profit, quantity of coal, character of overburden (whether clay or rock), transportation and preparation of coal and disposal of overburden, methods of mining the coal and removing the overburden, interest on capital invested and depreciation of plant, labor conditions and engineering services. From an approximate calculation of the quantities of overburden and coal, the engineer, after studying the foregoing factors, decides what would be reasonable costs per cubic yard for excavation of overburden and mining and preparation of coal per ton. Knowing the market price of coal and the desired margin of profit, the ratio of over-

Now, as to the independent shippers there are many reasons why an increased price is justified, important among which is the fact that most of their operations are on property owned by the larger producing companies and leased on a royalty per ton basis. The coal beds on this land are usually thin and difficult of operation, and for that reason the larger companies are satisfied to have them operated by individuals rather than go to the expense of taking out the coal themselves. Thus it can readily be seen that in addition to the royalty, the individual operator is put to the further expense of difficult and costly mining.

Then, again, many of the individual operations are now no more nor less than mines that have been abandoned years ago by the companies as unprofitable, yet are still made to produce a fair tonnage by "robbing" pillars. This, in addition to being dangerous, is also expensive, and an expense which must necessarily be added to the cost price of the coal.

OPERATE AT A LOSS IN THE SUMMER

In normal times the individuals operate practically at a loss in the summer time, when the demand for coal is at its lowest ebb, and in order to keep going are compelled to market their output at prices much below those of the companies, taking a chance of recouping their losses by selling coal at a premium in the winter.

X = Number of cubic yards of overburden to one ton of coal;

D = Cost of excavating 1 cu.yd. of overburden;

A = Market price of coal per ton;

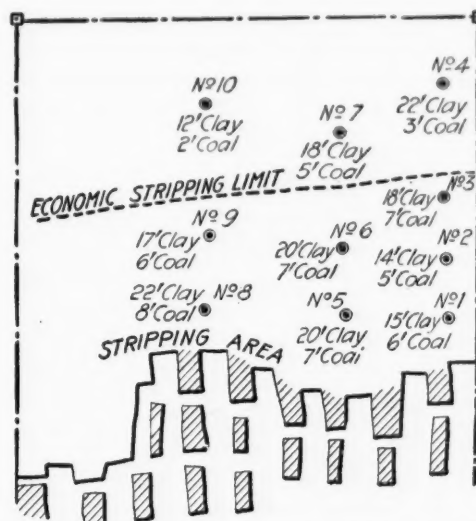
B = Margin of profit per ton of coal;

C = Cost of mining and preparation per ton.

The market price used in the above equation may be the operator's price direct to the consumer or the retailer. Another factor that may enter into the equation is the transportation or freight charges and other incidental expenses.

It can be seen that the ratio of overburden to coal depends primarily upon the market price, margin of profit, the cost of mining and preparation of one ton of coal and finally the cost of removing one cubic yard of overburden. With the overburden to coal ratio known, the question of defining the economic stripping limit is in order.

In determining the economic stripping limit, I have compiled the accompanying overburden-coal ratio table



PLAN SHOWING PROSPECTIVE STRIPPING AREA

for the various thicknesses of overburden and coal. The table is based upon the principle that one long ton of coal (sp.gr. = 1.378) in the solid, contains approximately 0.96 cu.yd., or by removing equal volumes of overburden and coal, it is necessary to remove 0.96 cu.yd. of overburden for one ton of coal. Considering then the thicknesses of overburden and coal equal to one foot for equal volumes, the ratio of overburden in cubic yards to one ton of coal is 0.96.

By studying the table, it can be seen that for a constant thickness of overburden and a variable thickness of coal the ratio is inversely proportional to the

thickness of the coal, while for a constant coal thickness and a variable depth of overburden the ratio is directly proportional to the overburden thickness. The figures in the left column show the overburden thicknesses in feet, while the top row shows the coal thicknesses in feet. The remaining figures show the overburden-coal ratio of the number of cubic yards of overburden to one long ton of coal.

The table is compiled for coal thicknesses of from 1 to 15 ft., overburden thicknesses of 1 to 65 ft. and

sumed. It will be assumed further that it is profitable to remove 3 cu.yd. of overburden to extract one ton of coal. The overburden coal ratio is thus 3 to 1. The plan on the preceding page shows the prospected area of a stripping under consideration.

Referring to the plan, No. 1 borehole shows 15 ft. of overburden and 6 ft. of coal. With a ratio of 3 to 1 and a coal thickness of 6 ft., the table shows that it is profitable to remove any overburden of a thickness up to and including 19 ft. No. 2 borehole shows

OVERBURDEN-COAL RATIO TABLE FOR DETERMINATION OF ECONOMIC STRIPPING LIMIT

Overburden Thickness, Feet	No. Cu.Yd. Overburden Ratio = Per One (Long) Ton Coal														
	Coal Thickness—Feet														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0.96	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	1.9	0.96	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
3	2.9	1.4	0.96	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
4	3.8	1.9	1.3	0.96	0.8	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3
5	4.8	2.4	1.6	1.2	0.95	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3
6	5.8	2.9	1.9	1.4	1.1	0.96	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4
7	6.7	3.4	2.2	1.7	1.3	1.1	0.98	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.4
8	7.7	3.8	2.6	1.9	1.5	1.3	1.1	0.96	0.9	0.8	0.7	0.6	0.6	0.5	0.5
9	8.6	4.3	2.9	2.2	1.7	1.4	1.3	1.1	0.99	0.9	0.8	0.7	0.6	0.6	0.6
10	9.6	4.8	3.2	2.4	1.9	1.6	1.4	1.2	1.1	0.96	0.9	0.8	0.7	0.6	0.6
11		5.3	3.5	2.6	2.1	1.8	1.5	1.3	1.2	1.1	0.96	0.9	0.8	0.8	0.7
12		5.8	3.8	2.9	2.3	1.9	1.7	1.4	1.3	1.2	1.0	0.96	0.9	0.8	0.8
13		6.2	4.2	3.1	2.5	2.1	1.8	1.6	1.4	1.2	1.1	1.0	0.96	0.9	0.8
14			4.5	3.4	2.7	2.2	2.0	1.7	1.5	1.3	1.2	1.1	1.0	0.97	0.9
15			4.8	3.6	2.9	2.4	2.1	1.8	1.7	1.4	1.3	1.2	1.1	1.0	0.96
16			5.1	3.8	3.0	2.6	2.2	1.9	1.8	1.5	1.4	1.3	1.2	1.1	1.0
17			5.4	4.1	3.2	2.7	2.4	2.0	1.9	1.6	1.5	1.4	1.3	1.2	1.1
18			5.8	4.3	3.4	2.9	2.5	2.2	2.0	1.7	1.6	1.4	1.3	1.2	1.2
19			6.1	4.6	3.6	3.0	2.7	2.3	2.1	1.8	1.7	1.5	1.4	1.3	1.2
20				4.8	3.8	3.2	2.8	2.4	2.2	1.9	1.7	1.6	1.5	1.4	1.3
21				5.0	4.0	3.4	2.9	2.5	2.3	2.0	1.8	1.7	1.6	1.4	1.3
22				5.3	4.2	3.5	3.1	2.6	2.4	2.1	1.9	1.8	1.6	1.5	1.4
23					4.4	3.7	3.2	2.8	2.5	2.2	2.0	1.8	1.7	1.6	1.5
24					4.6	3.8	3.4	2.9	2.6	2.3	2.1	1.9	1.8	1.7	1.5
25					4.8	4.0	3.5	3.0	2.8	2.4	2.2	2.0	1.9	1.7	1.6
26					4.9	4.2	3.6	3.1	2.9	2.5	2.3	2.1	1.9	1.8	1.7
27					5.1	4.3	3.8	3.2	3.0	2.6	2.3	2.2	2.0	1.9	1.7
28					4.5	3.9	3.4	3.1	2.7	2.4	2.2	2.1	1.9	1.8	1.7
29					4.6	4.1	3.5	3.2	2.8	2.5	2.3	2.2	2.1	2.0	1.9
30					4.8	4.2	3.6	3.3	2.9	2.6	2.4	2.2	2.1	2.1	1.9
31					5.0	4.3	3.7	3.4	3.0	2.7	2.5	2.3	2.2	2.1	2.0
32					5.1	4.5	3.8	3.5	3.1	2.8	2.6	2.4	2.2	2.2	2.0
33						4.6	4.0	3.6	3.2	2.9	2.6	2.4	2.3	2.3	2.1
34						4.8	4.1	3.7	3.3	3.0	2.7	2.5	2.3	2.3	2.2
35						5.0	4.2	3.9	3.4	3.0	2.8	2.6	2.4	2.4	2.2
36						5.0	4.3	4.0	3.5	3.1	2.9	2.7	2.5	2.5	2.3
37							4.4	4.1	3.6	3.2	3.0	2.7	2.6	2.6	2.4
38							4.6	4.2	3.6	3.3	3.0	2.8	2.6	2.6	2.4
39							4.7	4.3	3.7	3.4	3.1	2.9	2.7	2.7	2.5
40							4.8	4.4	3.8	3.5	3.2	3.0	2.8	2.8	2.6
41							4.9	4.5	3.9	3.6	3.3	3.0	2.8	2.8	2.6
42							5.0	4.6	4.0	3.7	3.4	3.1	2.9	2.7	2.7
43								4.7	4.1	3.7	3.4	3.2	3.0	2.8	2.8
44								4.8	4.2	3.8	3.5	3.3	3.0	2.8	2.8
45								5.0	4.3	3.9	3.6	3.3	3.1	2.9	2.9
46								5.1	4.4	4.0	3.7	3.4	3.2	2.9	2.9
47									4.5	4.1	3.8	3.5	3.2	3.0	3.0
48									4.6	4.8	3.8	3.6	3.3	3.1	3.1
49									4.7	4.3	3.9	3.6	3.4	3.1	3.1
50									4.8	4.4	4.0	3.7	3.5	3.2	3.2
51									4.9	4.4	4.1	3.8	3.5	3.2	3.2
52									5.0	4.5	4.2	3.8	3.6	3.3	3.3
53									5.1	4.6	4.2	3.9	3.7	3.4	3.4
54										4.7	4.3	4.0	3.7	3.5	3.5
55										4.8	4.4	4.1	3.8	3.5	3.5
56										4.9	4.5	4.1	3.9	3.6	3.6
57										5.0	4.6	4.2	3.9	3.6	3.6
58										5.0	4.6	4.3	4.0	3.7	3.7
59											4.7	4.4	4.1	3.8	3.8
60											4.8	4.4	4.2	3.9	3.9
61											4.9	4.5	4.3	4.0	4.0
62											5.0	4.6	4.3	4.0	4.0
63												4.7	4.3	4.1	4.1
64												4.7	4.4	4.1	4.1
65												4.8	4.5	4.2	4.2

Sp.Gr. Coal = 1.378.

ratios of 5 to 1 for coal thicknesses of 1 to 12 ft. and 4 to 1 for remaining coal thicknesses. From the foregoing principle, the table may be worked out for any desired coal and overburden thicknesses or ratio.

For any other specific gravity this table of ratios may be used by applying the ratio of the new specific gravity to the one used in the table. The greater specific gravity gives a greater ratio, while a smaller one gives a smaller ratio.

To show the application of the table, a problem in determining the economic stripping limit will be as-

sumed. It will be assumed further that it is profitable to remove 3 cu.yd. of overburden to extract one ton of coal. The overburden coal ratio is thus 3 to 1. The plan on the preceding page shows the prospected area of a stripping under consideration.

Referring to the plan, No. 1 borehole shows 15 ft. of overburden and 6 ft. of coal. With a ratio of 3 to 1 and a coal thickness of 6 ft., the table shows that it is profitable to remove any overburden of a thickness up to and including 19 ft. No. 2 borehole shows

5 ft. of coal and 14 ft. of overburden, so that with a ratio of 3 to 1, the table shows that it is profitable to remove overburden up to and including 16 ft. No. 3 borehole has 7 ft. of coal and 18 ft. of overburden, so that 21 ft. of overburden might be removed profitably. No. 4 borehole has 3 ft. of coal and 22 ft. of overburden, but the table shows that with a ratio of 3 to 1 only 9 ft. of overburden can be stripped profitably. The economic stripping limit then lies somewhere between No. 3 and No. 4 boreholes. This limit is found by interpolating as follows:

There are differences of 4 ft. of coal thickness between No. 3 and No. 4 boreholes and an overburden thickness of 4 ft. It is assumed that the coal thins out gradually from borehole No. 3 to borehole No. 4 and likewise the thickness of the overburden increases gradually. By interpolation midway between the boreholes, there are thicknesses of 20 ft. of overburden and 5 ft. of coal, so that with the ratio of 3 to 1, the table shows that only 16 ft. of overburden can be removed profitably. Again, by interpolation, one-fourth the distance between the boreholes, there are thicknesses of 19 ft. of overburden and 6 ft. of coal, and the table shows that 19 ft. of overburden can be removed profitably to mine the 6 ft. of coal, so that the one-fourth point between the boreholes locates the economic stripping limit. The same principle is followed out in locating other points upon the stripping limit line.

In determining the location of the stripping limit, of the overburden, the slope of excavation should be considered. General practice allows $1\frac{1}{2}$ and 2 to 1, slope for clay and sand, and $\frac{1}{2}$ and 1 to 1, slope for solid rock or shale.

(To be continued)

Some Interviews

This One with a Mining Town Parson

On the last day of my campaign for pledges toward the soldiers' Y. M. C. A. fund, I had the most interesting and suggestive interview of the campaign. Could I have had the benefit of it in the beginning of my canvass, my efforts would undoubtedly have borne better fruit.

The speaker was a mining camp preacher whose promised salary was so small that the earnings of his son, a trapper-boy, alone insured credit at the company commissary. As a matter of fact, the parson rarely collected to exceed one-half of the amount promised him by his flock.

Knowing all this, I had decided not to ask him for a pledge; but I ran across him unexpectedly in the timekeeper's office and felt that I might embarrass him if I ignored him in the presence of the timekeeper.

To my question, "Would you like to make a contribution?" he promptly replied, "Most certainly; isn't this my war?"

One remark led to another, until finally he gave me this: "Do you know, I believe that we cannot win this war until every last man realizes that this war is a personal matter and that as such it requires maximum personal effort; by effort I do not necessarily mean sacrifice.

"Ask the next man that you meet to tell you what he has done to help win the war, and you are more than apt to embarrass him; he may not be a slacker, slackers are not in the majority by any manner of means, but somehow he doesn't seem to understand that the things that he might do could affect the result of the conflict. 'What possible effect could one or two more tons of coal have on the final result, anyway,' he says to himself if he is a coal miner; and men in the other occupations have similar views.

"The inability of the average man to realize the importance of his 'bit' toward the successful conduct of the affairs of his town, his state, his country, and his world, is positively pathetic. Preachers have always realized this, but the war is bringing it home to many other men; before the end it will probably be brought home to all men.

"Take the 'white slave' evil, or the liquor evil, or the curse of grafting politicians, for illustration. How long could any of these things exist if every one opposed to them would make some effort to stamp them out? Ninety per cent. of our population, at least, are bitterly opposed to these things, and that 90 per cent. could easily stamp them out for all time in a few weeks if they made the effort; still year after year these evils continue to take their frightful toll. Mr. Average Man shrugs his shoulders when he sees them mentioned in his paper and then promptly turns his attention to the next column, and the thing passes from his mind.

"And in that way Mr. Average Man is helping to win this war up to the present time; he pores over the press dispatches, sighs, shrugs his shoulders, and then goes about his business.

"I have talked to our mine superintendent, to our office men and to our miners, and they all admit that the war is a terrible thing; still they don't act as if they realized that it is such a terrible thing. Of course, when their sons begin to come back maimed and crippled, while still others go to the land 'from whence no traveler returns,' things will undoubtedly be different; but in the meantime what a price to pay for indifference.

"There is one consolation; think of the kind of government we will have when this war makes everyone realize his personal responsibility toward his city, his state and his country, a thing that teaching and preaching have both failed to do."

Correspondent "Over There" for McGraw-Hill Papers

Robert K. Tomlin, Jr., managing editor of *Engineering News-Record*, sailed recently for France to serve *Engineering News-Record*, and the other papers of the McGraw-Hill Company, Inc., as special correspondent at the front. Mr. Tomlin was graduated from Harvard University in 1907. During his college course he served for two summers as assistant in the surveying and railroad field engineering of the Harvard Engineering Camp at Squam Lake, N. H. After graduation, he entered the employ of the Pennsylvania R.R. on the tunnel work in connection with the Pennsylvania Station in New York City. He left this work to go to the New York Board of Water Supply, and was stationed with the Northern Aqueduct Department at Poughkeepsie, New York.

His journalistic experience dates from March, 1909, when he became assistant to the editor of the *Engineering Record*. He was subsequently made associate editor, in charge of the municipal and sanitary field, and in 1913 was promoted to managing editor. When *Engineering News-Record* was formed last April by the consolidation of *Engineering News* and the *Engineering Record*, Mr. Tomlin was made managing editor.

Wastes of Coal in the United States

AS A means of far-reaching economy, the Government of the United States should at this time apply intelligent and direct-acting efforts to the conservation of fuel at the industrial plants which are responsible for its greatest consumption. It is unnecessary here to show proof that coal is wasted in vast quantities in the boiler furnaces of many plants, to feed which it is mined and distributed at a high and ever-increasing cost of labor and material.

The mining and distribution of coal have been placed under the supervision of the War Coal Board in order more nearly to meet the crying needs in these directions, to use the railroad facilities more efficiently so that the present car shortage may be minimized to the greatest possible extent, and to apportion the coal in quantity and to uses deemed most expedient.

While this organized effort to bring about efficiency in the production and distribution of coal is being made, no parallel measures have been adopted to bring about a normal and practicable efficiency in its use. The hundreds of large plants which are consuming fuel wastefully, in many cases more wastefully and carelessly than ever before, are directly and needlessly causing a large fraction of the existing car shortage. They are overloading the already strained capacity of the railroads; they are rendering slower and more difficult the transportation of food and other vital commodities, and in short they are simply counteracting the measures of efficiency in production and distribution which have elsewhere been established.

PREVENTABLE WASTE OF FUEL

The preventable waste of fuel in the boiler furnace of one steel mill amounted to 40,000 tons per year, which at \$5 a ton would cost \$200,000. This was a comparatively modern plant. The efficiency of boilers and furnaces in a 14-day test was 55 per cent. The load factor was unusually favorable to high efficiency and could readily be raised to 70 per cent. or over. This is only one example, and there are many more extreme cases. In one hand-fired plant the evaporation was raised from 6 to 9 lb. in a few days of instruction, and continuously kept close to this higher mark with the help of coal and water measurements which were inaugurated. The saving was due exclusively to instruction and consequent better operation.

The saving or wasting of one-fourth of the coal consumption of any industrial plant depends entirely upon the efficiency of its operating management. Let me emphasize that this fraction of the consumption relates exclusively to the boiler plants—that is, the production of steam—and does not include the large economies possible in distribution and use.

For well-known reasons the boiler plant offers the

With the hope of quickening the campaign for the conservation of fuel during the war, and in order to get the problem generally before those who are immediately interested, the Bureau of Mines has reproduced an article by David Moffat Myers, member of the American Society of Mechanical Engineers, on "Preventable Waste of Coal in the United States; with a Consideration of Alternative Methods of Its Elimination." This article was presented at the annual meeting of the Society in New York, Dec. 4 to 7, and is here published in part.

more lucrative field for producing economies, and these with a minimum of alteration in physical equipment. Under present conditions a plant which carelessly operates at an efficiency of 40 to 50 per cent. receives from the Government the same consideration in the delivery of coal as the one whose efficiency is 70 to 75 per cent. This obviously is unfair as well as wasteful. The Government hands

over, say, 200,000 tons of coal a year to a plant owner, but asks for no account as regards its consumption, nor any questions as to the amount of steam it is made to produce. There is nevertheless an equivalent amount of steam this fuel is capable of generating, and it can and should be made to produce that quantity.

CONSERVATION METHODS

The object of this paper is to open a discussion which it is hoped will ultimately lead to the formulation of definite recommendations of means for the reduction of the present great preventable waste of fuel in our industries; to direct such means principally toward the elimination of that portion of the present waste which is due to faulty, careless and uninformed operation of plants; to forward these recommendations to the proper governmental authorities as an official communication of this society, and to offer to the Government the services of the society for the organization, furthering, and, as far as possible, the execution of the plan which may as a consequence be adopted.

In general, there are two plans of operation worthy at least of consideration. One might be termed the autocratic method. This would involve the use of authority to compel coal consumers to execute such measures of economy as the proper authorities might prescribe for any given case. Limits should be set as to expense to the user. Such limits might be in terms of a percentage of the present yearly coal bill. Alterations to be directed chiefly, as previously implied, to purely operating improvements. Many objections would probably be made by consumers against this plan, but once in effect the majority would no doubt realize its pecuniary advantage to themselves. But its tendency may be too strongly opposed to democratic principles.

The other plan would be largely an educational one, in which patriotism and efficiency would furnish the motive forces required.

The teaching must be accomplished with the utmost simplicity and directness. Above all it must be in such form as to be readily comprehended and applied. This is a big task, but these things should and can be accomplished.

The requisite information must reach the owners and managers of industries, and there must be simple instruction sheets for the engineers and firemen. The vital importance of daily accurate records of coal and

water must be taught and information given regarding practical appliances for automatic measurements of both.

Blank forms might be sent in advance to plant owners in order to be advised by them, first, whether they would be willing to cooperate with a governmental organization offering to assist them in reducing their coal consumption, and second, to obtain such data as to size, type, equipment, operation and fuel consumption of the plants as would enable a classification which would permit a Government board of experts to send such instructions as would include the information needed for any one class of plants.

This work would be greatly aided by a staff of experts ready to visit plants when so requested by owners and make investigations and recommendations and keep in touch with the progress of economies. Included in such a staff should be men intimately familiar with practical operating economies whose duties would be the delivering of lectures or talks, which should be planned so as to reach directly not only managers and owners of the industries, but also the chief engineers and firemen of the boiler plants. This feature of the plan, by itself, would undoubtedly result in great savings.

The United States Bureau of Mines has for a number of years engaged in obtaining and disseminating scientific information regarding the mining and consumption of coal, and the results of the work have been of great value to technical engineers who are able to use and apply it. It is evident that we now require an extension of the idea of education, but in such form as directly to affect the men who run the boiler plants of our country, for in their hands is the saving or wasting of one-fourth of our fuel supply.

Six hundred million tons of coal were mined in the United States in 1916. If we assume only one-half of this to have been used for our industrial boiler plants, then a quarter of the coal used under boilers amounts to 75,000,000 tons per year. It is worth while to save this fuel by preventing its waste. This quantity of coal represents the use of 1,500,000 fifty-ton freight cars.

Individual Price Differential

At the present time there is considerable agitation on the part of some interests in the coal trade against the differential of 75c. allowed the individual shippers above the company prices for anthracite coal at the mines, as fixed in the Presidential orders of Aug. 23 and Dec. 1. The chief objectors are the retail dealers. They have now been able to convince the fuel committee of one city to such an extent that this committee has made an appeal to the National Fuel Administration for the repeal of this differential.

The chief argument of the retail men is that the differential prevents uniformity of retail prices. But the question at once arises, When did the retailers become such sticklers for a standard retail price? In ordinary times in most of the larger cities there has always been a wide variation in prices, according to the locality in which the dealer was located. This was particularly so in those cities where the price-cutting element among the retailers had for years prior to the present stressful times made the matter of a uniform price absolutely impossible.

Now, as to the independent shippers there are many reasons why an increased price is justified, important among which is the fact that most of their operations are on property owned by the larger producing companies and leased on a royalty per ton basis. The coal beds on this land are usually thin and difficult of operation, and for that reason the larger companies are satisfied to have them operated by individuals rather than go to the expense of taking out the coal themselves. Thus it can readily be seen that in addition to the royalty, the individual operator is put to the further expense of difficult and costly mining.

Then, again, many of the individual operations are now no more nor less than mines that have been abandoned years ago by the companies as unprofitable, yet are still made to produce a fair tonnage by "robbing" pillars. This, in addition to being dangerous, is also expensive, and an expense which must necessarily be added to the cost price of the coal.

OPERATE AT A LOSS IN THE SUMMER

In normal times the individuals operate practically at a loss in the summer time, when the demand for coal is at its lowest ebb, and in order to keep going are compelled to market their output at prices much below those of the companies, taking a chance of recouping their losses by selling coal at a premium in the winter season, when certain sizes are in strong demand. Even under this method of operation there have been years when the individuals have barely come through with a clean sheet on the proper side of the ledger. Many of them in the past have been enabled to offset their losses by handling bituminous coal on a brokerage basis and thus utilizing their sales forces in carrying two lines. Now this is all a thing of the past, as there is no bituminous coal to be had by the independent houses.

Another factor that enables the big companies to sell at a lower circular price than the independents is the immense and rapidly increasing tonnage of washery coal being sent to market by them. This is all coal that was thrown away years ago as waste, yet is marketed today at the full circular price. Money derived from its sale is thus practically clear profit with the exception of the labor cost entailed in sizing it for market. All this material was mined years ago, and its cost was actually covered in the sale of marketable sizes at that time.

Coming Meetings

American Wood Preservers Association will hold its annual meeting Jan. 22-24, 1918, at Chicago, Ill. Secretary, F. I. Angier, Baltimore, Md.

United Mine Workers of America will convene at Indianapolis, Ind., Jan. 15, 1918. Secretary, William Green, Merchants National Bank Building, Indianapolis, Ind.

National Retail Coal Merchants' Association will hold a convention Jan. 8 and 9 at Auditorium Hotel, Chicago, Ill.

American Institute of Mining Engineers will hold its annual New York meeting Feb. 18 to 21, in the rooms of the society, 29 West 39th St. Secretary, Bradley Stoughton, New York.

Explosives Regulation Sign

War legislation is daily adding to the complexity of duties of the average American at our mines and in our industrial plants. Section 16 of the new Explosives Act stipulates that all premises whereon explosives or ingredients of explosives are stored shall be plainly and conspicuously marked with a sign reading "Explosives, Keep Off."

Special emphasis is laid on the fact that this act applies to all ingredients of explosives as well as to the



explosives themselves. Failure to comply with the conditions is severely penalized, and inspectors are instructed to enforce the provisions strictly. The illustration shows a danger sign made by the Stonehouse Steel Sign Co. These are handled by the Mine Safety Appliances Co., of Pittsburgh, Pennsylvania.

The sign is made of steel and is in black, red and white. It has been approved by the Explosives Department of the Bureau of Mines as meeting the requirements of the Explosives Regulation Act.

Christmas at Glen White, W. Va.

Christmas joy and good will came in huge chunks to the residents of Glen White, W. Va., on Christmas Day. By the time the clerical force and delivery wagons of the E. E. White Coal Co. had finished their happy labors, not a family in the pretty mining town was without a fat turkey, all the necessary adjuncts, and a snug bit of cash to spare.

As has been its custom for years, the company presented each family with a turkey, all the children with candy, nuts and fruit, and this year added to the generosity for which it holds an enviable reputation by presenting each employee with a brand new five-dollar bill, together with a cash bonus of one dollar for each year of service with the company. The cash bonus was the fourth paid out this year and netted some of the oldest employees nearly a half hundred dollars.

Prominent in the celebration of the Christmas anniversary were entertainments in both the white and colored departments of the public schools. The dedication of a handsome church completely finished and equipped, with up-to-date heating and lighting facilities, presented by the company to the congregation of the First Baptist Church (colored), was a fitting testimonial of the good will of a generous coal-mining com-

pany to its numerous loyal and faithful employees. In order to do their part toward relieving the national coal shortage the employees of the E. E. White Coal Co. were idle on Christmas Day only. They resumed work on the morning of Dec. 26.

The E. E. White Coal Co. was by no means alone in the generosity shown toward employees. Many operators, both in the anthracite and bituminous fields, in additions to turkeys and other good things made gifts of clothing to needy ones.

Some Figures on Coal Movement

Recently compiled tables showing the number of loaded coal cars from mines on the Norfolk & Western Ry. disclose some interesting comparisons. It is the opinion of men familiar with conditions in that region that the large falling off is due more than anything else to the inability of connecting lines to handle properly the cars delivered to them. This is particularly true in the West, where yard and other facilities have not been expanded to keep up with the increase in traffic. It follows also that the shortage of sidetracks and of motive power on the Norfolk & Western itself has had its bearing. Only a small part of the difficulty is due to any shortage of labor at the mines in question. The figures are significant:

EQUIVALENT CARS (100,000 LB.) OF COAL LOADED ON NORFOLK & WESTERN RAILWAY

District	Comparison of First Eleven Months		1917	
	1917	1916	Increase	Decrease
Pocahontas.....	303,736	323,688	.....	19,952
Tug River.....	81,465	92,639	.....	11,174
Clinch Valley.....	26,150	28,768	.....	2,618
Kenova.....	16,510	20,681	.....	4,171
Thacker.....	95,890	99,608	.....	3,718
Total.....	523,751	565,384	.....	41,633

Decrease, 41,633 equivalent cars = 2,081,650 net tons.

Apportionment of Freight to Coal

Experience has shown that in the United States the normal balance in transportation which brings about a maximum of production with maximum economy occurs when out of every 100 tons of originating freight approximately 56 tons are unmanufactured mineral products and 44 are manufactured products, foodstuffs and other commodities, and when of the 56 tons of mineral products 35 tons are coal. Of these 35 tons of coal the railroads themselves consume about 12 tons.

The present balance of transportation is a great reduction in the proportion of the cars furnished for the transportation of coal. The railroads, however, are consuming their full quota of coal, so that while under favorable and natural conditions 35 tons of coal would be moved, out of each 100 tons of freight, there is now being moved very much less coal. The entire coal shortage is thrown upon the industries of the country and the domestic users, who, instead of having a coal supply equal to two-thirds of the total coal movement, are reduced to a small and continually diminishing ratio, and this in a time when every effort is being made to stimulate the industrial effectiveness of the nation.

The commission believes that the coal industry is paralyzing the industries of the country, and that the coal industry itself is paralyzed by the failure of transportation.—Federal Trade Commission.

Dodson Coal Co. Not to Renew Lease on Morea Colliery

With the close of the year 1917, the 30-year lease of the Dodson Coal Co. on Morea Colliery, with an annual shipment of 250,000 tons, expires, and the colliery is being taken over by the New Boston Land Co. It will be operated in conjunction with the New Boston Colliery as one operation.

The taking over of this colliery by the New Boston Land Co., closely allied with the Mill Creek Coal Co., operating the New Boston Colliery, is the sequel to a controversy covering several years.

The New Boston Colliery lies to the east of the Morea Colliery in the same basin, and when the workings of the former were driven west they were extended right up to the line dividing the two leases, leaving no barrier pillar east of the line.

About the first of the year 1910 the east gangways of the Morea Colliery were approaching this same line, and the late John Curran, then district mine inspector, gave orders to leave a barrier pillar of 300 ft. on the west side of the line. The Dodson Coal Co. claimed this to be a hardship and a big loss to them and contrary to the mine laws, which required a barrier pillar to be left in each side of a dividing line. Mr. Curran took the case into court and had an injunction issued refraining the operators from driving workings that would reduce the barrier pillar to less than 300 ft. This injunction has never been dissolved, but now that the two collieries are to be operated as one, the danger of the one being allowed to fill with water will not be renewed and the coal left in this pillar will probably be recovered.

The personnel of the organization in charge of the collieries is announced as follows: General manager, J. E. Jones; general superintendent, Frank E. Patterson; inside superintendent, William Thomas; inside foreman, Daniel Brennan; outside foreman, Louis Greis.

The lease of the Dodson Coal Co. in the Morea Colliery expires with the close of the year, and the operation is being taken over by the land owners, the Delano Land Co., and will be operated by them in conjunction with the New Boston Colliery adjoining.

The surrender of this lease by the Dodsons is the sequel to the lawsuit brought by them against the Delano Land Co. for the recovery of losses claimed by the former on account of the ruling of the courts upholding the mine inspector in his decision requiring the Dodson Coal Co. to leave intact a barrier pillar of 300 ft. between the workings of Morea and New Boston Collieries.

Putting Coal on War Basis

United States Fuel Administrator Harry A. Garfield, testifying before the Senate Subcommittee investigating coal conditions, made the following statement:

The coal year of 1917 was well under way before the Fuel Administration was created. The distribution of the coal output, which was largely under contract for delivery during the year, had already been arranged on a peace-time basis. It was necessary that these peace-time arrangements should be so altered as to meet the war demands. But it was quite as necessary that no action should be taken which would throw the entire fuel situation into chaos.

President Wilson, in announcing his original schedule of prices for bituminous coal, recognized this condition and

said that there will be no immediate wholesale interference with contracts already made.

Prices were at their highest when most of these contracts were made, and up to date there has been but a small proportion of the coal output available for distribution outside of these contracts. Many contracts, of course, have run out, but a large majority of the coal mined is still sold under contracts running until Apr. 1, 1918. The Fuel Administration found it was in dire need of "free coal" to distribute to important Government plants, to public utilities and institutions and domestic consumers.

The distribution department of the Fuel Administration, starting with the small amount of "free coal" available as the difference between contracts and the output of various mines set out to meet this emergency. Many of the coal operators offered their aid. In many cases the plans of the Fuel Administration have diverted coal at Government prices from mines which were unable to deliver under contracts calling for a much higher price.

The Fuel Administration has undertaken to so direct the peace-time arrangements of the coal industry that they will temporarily meet the war emergency. Many of the steps taken in this direction are wholly temporary and of an emergency nature. They are designed to carry the country through the present winter with the least possible distress.

We are not putting into effect plans which will place the entire coal industry on a war basis. These plans will be wholly effective beginning with Apr. 1, 1918, when the present coal year will come to an end.

In this connection the Fuel Administration is establishing a zone system of distribution. Under this zone system the output of a given coal field will be assigned generally to a given consuming territory. It will be arranged that the producing field and its consuming territory shall be connected by the shortest possible transportation distance. This will eliminate, so far as possible and practicable, all cross-hauling of coal on the way to market and will tend to relieve transportation conditions.

Legal Department

INDIANA MINE SAFETY REQUIREMENTS—The statutory duty of Indiana mine operators to cause loose coal, slate or rock overhead to be taken down or secured is limited to travel and airways and does not apply to miners' working places. (Indiana Appellate Court, Peacock Coal and Mining Co. vs. Crawford, 117 Northeastern Reporter, 504.)

INJURY TO CONTRACTOR'S EMPLOYEE—A coal company, having awarded a contract for the mining of its coal at a fixed price per ton and on condition that the contractor should attend to roof propping and the taking down of drawslate, is not liable for injury to an employee of the contractor for injury due to a fall of slate, although the injured employee was paid directly by the company, such payments being made for the account of the contractor and being deducted from money due him on his contract. (Kentucky Court of Appeals, Lyttle vs. Rex Coal Co., 197 Southwestern Reporter, 1070.)

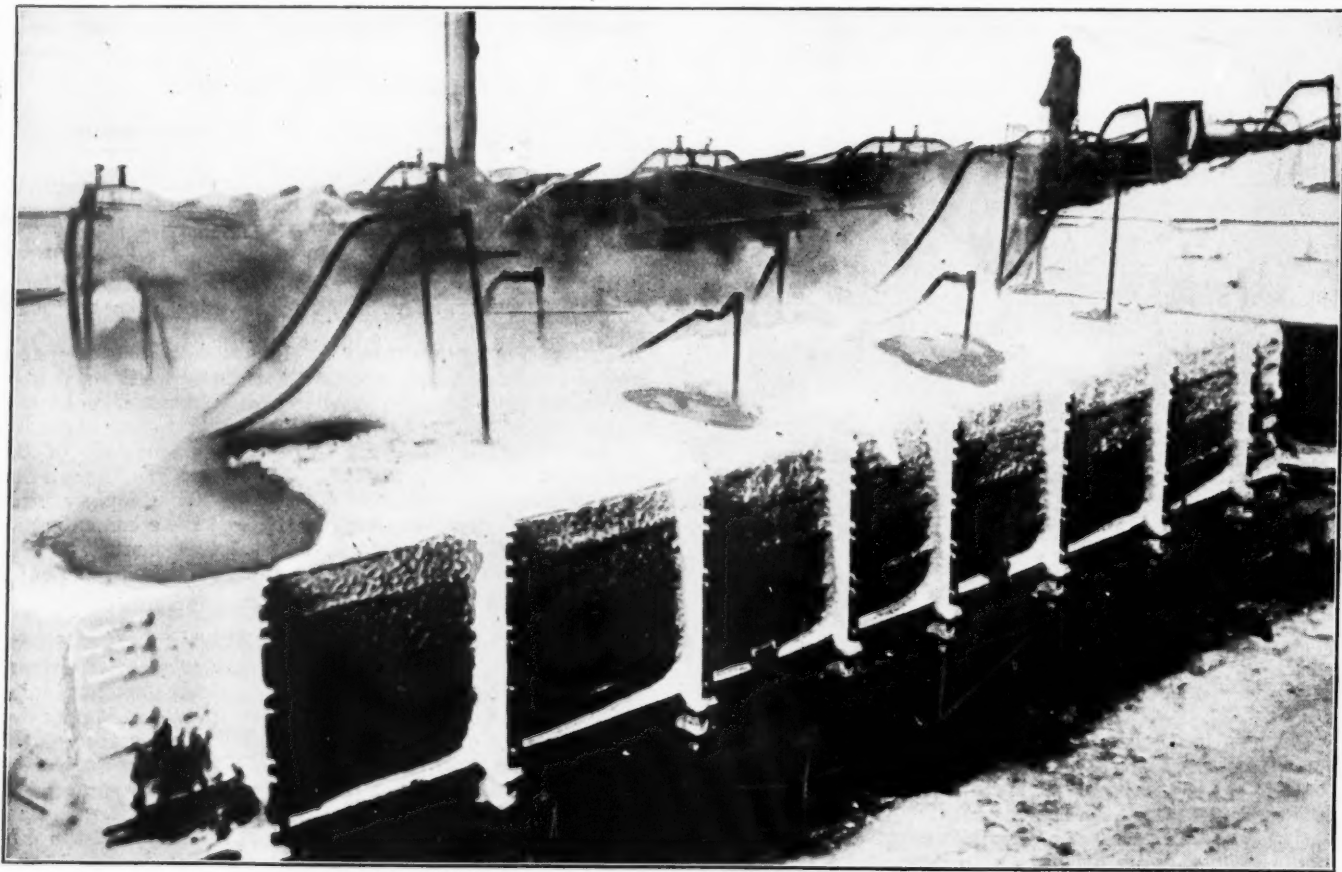
SUITS AGAINST NONRESIDENT CORPORATIONS—A coal company organized under the laws of another state, maintaining no office or agency in West Virginia, was not doing business in the state through the mere fact that it operated its own barges and boats along the Ohio River from Pittsburgh to Cincinnati and other lower points, so as to render its captain subject to service of process in a suit against the company while in West Virginia waters. Nor did the fact that perils of navigation may have compelled the captain to temporarily take refuge along the West Virginia shore render him subject to service of such process. (West Virginia Supreme Court of Appeals, Hayman vs. Monongahela Consolidated Coal and Coke Co., 94 Southeastern Reporter, 36.)

SNAPSHOTS IN COAL MINING



MARION STEAM SHOVEL AT WORK ON DELAWARE & HUDSON CULM DUMP

This shovel is moving nearly 20,000 cu.yd. of material per month and is owned by Porter Bros., contractors. At the time this photograph was taken the thermometer registered 5 deg. above zero. Some cold!



THAWING FROZEN CARS OF COAL TO HELP RELIEVE THE SHORTAGE

In addition to the difficulties of transporting fuel on account of the rail congestion intensified by the recent snow and very cold weather, the Fuel Administration has had to contend with frozen coal, which must be thawed out before it can be dumped from the cars. The thawing process consists of forcing live steam through pipes and hose that extend into the heart of the frozen mass.



VIEWS OF THE KAYN MINE OF THE LICK BRANCH COAL CO., AT COXTON, HARLAN COUNTY, KENTUCKY
 Above—A string of empties returning to the mine. Below—The tippie and incline



[Men of the coal industry who find it necessary to get to the national capital on business these days are invited to avail themselves of the facilities afforded by the Washington Bureau of "Coal Age," which is centrally located in the Metropolitan Bank Building. The bureau is in charge of Paul Wooton, who is in a position to be of material assistance to those who have business to transact with Government officials. Have your mail addressed care of "Coal Age," Room 703, Metropolitan Bank Building, Washington, D. C., while at the capital.—Editor.]

Weekly Production Statistics

The depression in the bituminous industry caused by prolonged cold weather continued during the week of Dec. 22. The total production of soft coal (including coal made into coke) is estimated as 9,917,145 net tons. This, although a substantial recovery when compared with the preceding week, was still 10.8 per cent. below the output during the week of Dec. 8. The average production per working day was 1,652,858 tons, as compared with 1,638,513 tons during mid-August, at the time of the coal strikes in Illinois and Southern Appalachians. Beehive coke reflected the recovery in the entire bituminous industry. The total production during the week is estimated as 545,433 net tons, an average per working day of 90,906 tons. This was still 10.4 per cent. below the production during the week of Dec. 8. Shipments reported by the nine anthracite carriers amounted to 36,060 cars, an increase of 4382 cars over the preceding week. The production of anthracite, however, was still 11.3 per cent. below the mark set during the week of Dec. 8.

For the country as a whole the week's production amounted to but 57.7 per cent. of the full-time capacity. The cold weather and snow increased the losses attributed to each one of the principal causes of lost time. The toll exacted by mine disability rose from 3.9 to 6.2 per cent. of the full-time capacity. Losses due to labor shortage and strikes, although amounting to but 3.7 per cent., reached the highest point recorded since the week of Nov. 3. Losses attributed to car shortage were the highest reported since the weekly bulletins were begun, says E. E. Leshner, of the United States Geological Survey. Thirty and eight-tenths per cent. of the full-time capacity was reported as lost on account of lack of cars at the mine mouth.

Beehive coke operations in the Connellsville and adjacent districts of Pennsylvania, during the week of Dec. 22, exhibited a partial recovery from the extreme de-

pression of the preceding week. The plants reporting produced 56.8 per cent. of their capacity in coke, as rated by the railroads, compared with 49.5 per cent. during the week of Dec. 15. Twenty-nine and six-tenths per cent. of the full-time output was reported lost on account of a shortage of coke cars. The unusually high losses attributed to lack of cars were undoubtedly due in large measure to the burden imposed upon the railroads by the snow and cold weather.

Demand Efficient Distribution

Sharp criticism of the Fuel Administration has arisen over the shortage of coal in New York harbor. Interference with the regular movement of coal for bunker use resulted in the holding up of shipping equivalent to many round trips of a single vessel to Europe. Responsibility for the shortage seems to be shared by several of the factors involved, but many contend that the Fuel Administration should have made such an occurrence impossible at a time when full efficiency of shipping is of such transcendent importance. This and similar instances have given rise to an insistent demand for more efficient direction of the Fuel Administration's division of distribution. The experience of the last several months is held to show that a lack of foresight exists when such situations are allowed to become acute. Steps taken in time not only would prevent situations of far-reaching seriousness, but, it is said, would avert the disturbing element of drastic action which has to be taken when all reserves of coal are exhausted.

To See That Orders Are Filled

One of the direct results of the Senate probe into the coal situation was the hurrying toward operation of the Fuel Administration's plan to divide the entire country into consuming and producing districts. The appointment of D. R. Lawson, of Fairmont, W. Va., as the deputy distributor for a district in West Virginia, is the forerunner of the appointment of other deputy distributors. Mr. Lawson will have charge of a producing district consisting of Barbour, Braxton, Gilmer, Harrison, Nicholas (Gauley district of Baltimore & Ohio R.R.), Lewis, Marion, Monongalia, Preston, Randolph, Taylor, Upshur and Webster Counties. As the activities of this distributing office will likely be the same as in the other nineteen producing districts, there is unusual interest in the following instructions issued to Mr. Lawson for the conduct of his office:

1. On receipt of requests for fuel from state fuel administrators and on receipt of requests and orders for fuel from the United States Fuel Administrator, to allot such requests and orders to individual shippers and mines in the above-named area as equitably as possible, and with a view to securing prompt compliance with such orders without undue hardship to individual shippers.

2. To report to the United States Fuel Administrator in detail on each request received from state fuel administrators and describe the action taken, including the name of the shipper or mine to which the request or order was allotted.

3. To arrange with each individual shipper and mine in your district for daily notice to you of production, working time, car supply, shipments, contracts and free coal.

4. To compile reports of production, working time, car supply, shipments, contracts and free coal and to report such figures to Washington in totals at the close of each business day, beginning at once. Forms for reporting this information will be forwarded to you as soon as prepared.

5. To comply with all instructions issued by the United States Fuel Administrator governing the conduct of your office and to recommend to the United States Fuel Administrator, from time to time, any changes in practice which might result in more efficient administration.

Contracts to Be Regulated

In order that in 1918 the whole coal output, including the coal which the mines had contracted to deliver, shall be under the direct and effective control of the Fuel Administration, an order has been issued regulating the terms of all contracts for the future delivery of coal. The order makes it plain that all contracts for the sale of coal or coke are subject to cancellation by the President or by the Fuel Administration acting by his authority.

The order limits contracts by providing that no contract shall call for the delivery of coal or coke over a period of longer than one year, and the order directs that the year period thus allowed shall terminate not later than eighteen months from the date the contract is made. Contracts must be placed at the prices fixed by the President and the Fuel Administration, and must provide that the coal or coke affected by the order is subject at all time to requisition or diversion by the Fuel Administration.

Contracts made under this order will not be recognized if they involve "Railroad cross-hauling of coal, except in the case of gas coal or coal to be used for byproduct purposes." This provision will eliminate one of the transportation difficulties now confronting the Fuel Administration, and will insure the movement of coal from mine to consumer along the shortest possible transportation lines. The order is here reproduced in full, as follows:

The United States Fuel Administrator, acting under authority of an Executive Order of the President of the United States, dated Aug. 23, 1917, appointing said Administrator, and in furtherance of the purpose of said order and of the Act of Congress therein referred to and approved Aug. 10, 1917, hereby orders and directs that under further or other order of the United States Fuel Administrator and subject to modification hereafter from time to time and at any time, the following regulations are established relative to contracts for the sale of coal and coke. A coal or coke operator or producer may, in accordance with these regulations and not otherwise, make contracts for the sale of coal mined or produced, or of coke produced or made, by him with any consumer or other person including jobbers.

1. No such contract shall provide for the delivery or supply of coal or coke over a period longer than one year;

and such period of one year shall terminate at a date not more than eighteen months from the date of actual execution of the contract.

2. Every such contract for the sale of coal shall provide that the price of any coal delivered thereunder shall, with respect to each shipment of coal under such contract, not exceed the price at the mine as fixed by the President, or by the United States Fuel Administrator under authority of the President, and in effect at the date of such shipment from the mine.

3. Every such contract for the sale of coke shall provide that the price of any coke delivered thereunder shall, with respect to each shipment of coke under such contract, not exceed the price for coke as fixed by the President, or by the United States Fuel Administrator under authority of the President, for the kind of coke specified in the contract, and in effect at the date when such shipment of coke leaves the point at which it is produced or stored.

4. Every such contract shall provide that the same shall be forthwith cancelled and of no further binding effect upon either party thereto, upon receipt of a request or an order from the United States Fuel Administrator for such cancellation, and that in case of such cancellation neither party to the contract shall be under any further liability to the other thereunder and that neither shall have any claim against the United States Government by reason of such contract or the cancellation thereof.

5. Every such contract shall provide that coal or coke deliverable thereunder shall be subject to requisition by the United States Fuel Administrator, including under the term requisition the right to divert such coal or coke to any other party than the purchaser named in the contract; that such requisition may be made at any time during the continuance of the contract and prior to actual receipt and unloading of the coal or coke so requisitioned, at the point of ultimate destination, by the person entitled thereto under the terms of the contract; that such requisition shall be made at the going Government price at the date of shipment from the mine of the coal so requisitioned or of the shipment of the coke so requisitioned from the place of production or storage thereof, and without other or further liability of the Government to either party to the contract than the payment of such price and freight, so far as either party to the contract may at the time of such requisition or diversion be liable for such freight payment.

6. A jobber may make contracts for the sale of coal or coke owned by him, or to which he is entitled under contracts made by him with operators or producers in conformity with these regulations, at a price not exceeding the purchase price paid or payable by such jobber for such coal or coke under the limitations of the foregoing paragraphs numbered (2) and (3), plus such commission as may, at the time of the shipment thereof from the mine where such coal is produced or from the place where such coke is made or stored, be the then permissible jobbers' commission. All such contracts by jobbers for the sale of coal or coke shall conform to the provisions and requirements in the foregoing paragraphs numbered (1), (4) and (5).

7. Every coal or coke operator or producer and every jobber shall send within ten days of the execution of any contract by him a certified copy thereof to the United States Fuel Administrator at Washington, D. C., marked "Attention of Legal Department."

No contract may be made, or will be recognized as valid, by the United States Fuel Administrator, which involves railroad cross-hauling of coal, except in the case of gas-coal or coal to be used for byproduct purposes.

Oral contracts for the delivery or supply of coal or coke will in no cases be recognized by the Fuel Administrator as valid or binding upon either party thereto and are prohibited.

All and any contracts for the sale of coal or coke are subject to cancellation and termination at any time by the President or by the United States Fuel Administrator acting under authority of the President.

THE LABOR SITUATION

General Labor Review

It is not unnatural that the substitution of a nine-hour or longer day for an eight-hour day in the anthracite region meets with some opposition from the mine workers, though some are even now, and have for some time, been working long hours of overtime. It has been generally contended that men in nine hours can do no more than in eight, and fallacious figures have been advanced to prove it. Under normal conditions it is probably true that the shorter day is nearly long enough for a man to do his most effective work, but given the larger incentive of patriotism a bigger stint for a short while can be secured by longer working hours.

It is interesting to notice the reason given for opposing the longer working day. The mine workers do not say that eight hours is enough for any man to work. They realize fully that it is their duty and their patriotic pleasure to work as many hours as will best promote a large production. It is a loyal reason they give for the shorter day. The mine workers, we read, "believe the increased work day would hurt the coal tonnage more than help it."

LONG DAY WOULD INCREASE TONNAGE 10 PER CENT.

A. B. Jessup, the manager of G. B. Markle Coal Co., has addressed himself to meeting that argument. He says that the introduction of the nine-hour day would increase tonnage 10 per cent. Mr. Jessup says his firm needs 500 miners and laborers and 250 to 300 outside men, but cannot get them though it has plenty of work, rents are low and houses are on hand for all who want them.

He also says that there has never been any trouble from car shortage at the Markle mines. It is true that cars are scarce in the latter half of the week, but the collieries and breakers are operated regardless of that condition, for all the mines have storage bins into which the coal is dumped and from which the coal is loaded as soon as cars are available. In a vote of the locals in the Hazleton region the mine workers declared against the proposed increase in length of day. President Kennedy seems to be in full sympathy with the men of his district. He declares that if the long day would produce more coal the railroads could not handle it, and the production would demand more timber and supplies than could be secured.

MINERS SEEK BONUS FOR WORKING ON FUNERAL DAYS

The Wyoming Valley mine workers have shown such a generous comprehension of the needs of the time that one wonders how a piece of news like the following can be justified by facts:

"Two thousand mine workers at the South Wilkes-Barre No. 5 Colliery have notified company officials that they will take time off to attend the funeral of any of their fellow union workers unless the company makes an extra cash settlement with the families of the mine workers who meet death while at work."

The mine workers' families are already compensated in case of death, and there is a provision in the mine workers' contract that they work steadily so long as work is provided. This recent demand is therefore little else than blackmail and not at all worthy of the Wyoming mine workers. If they are not satisfied with the compensation provided, let them seek legislation in accord with their ideas.

Apparently this is the view of the Lehigh & Wilkes-Barre Coal Co. Various mine workers' organizations in the Wyoming Valley have consented to send only delegations to all funerals, leaving the main working force free to give its services to the company. They are now asking \$100 as a reward for doing nothing more than complying

with their contract and supplying the coal which the necessities of the nation imperatively demand. They want pay for their work and pay again for being willing to perform it.

WOMEN ARE ENTERING MINE CLERICAL SERVICE

Seven women and girls have been appointed to clerical work at the Cameron Colliery by Superintendent William Auman. Mrs. Cora Van Gasken furthermore has been made weighmistress at the same mine. The Cameron colliery is the property of the Susquehanna Collieries Co., a subsidiary of the M. A. Hanna Co., of Cleveland, Ohio. The mine workers used to be averse to women employees, but under the present circumstances they are withdrawing their objection.

The supply of cars in the bituminous region has fallen off deplorably by reason of the snow, according to a report of the United States Geological Survey, just received. In the Hazard field, Kentucky, in the week ending Dec. 15, the tonnage was reduced to 66.4 per cent. of capacity, 65.5 per cent. being the loss due to car shortage. Northeastern Kentucky failed by 64.9 per cent. of reaching full capacity, 60.9 per cent. being the shortage due to lack of cars. Somerset County, Pennsylvania, came third with 55.7 per cent. of capacity, 52.5 per cent. being chargeable to insufficient car delivery.

UNFORTUNATE EFFECTS OF MINE DISABILITY

But when the railroads are blocked with snow the mine tracks are also similarly encumbered. Cold weather breaks and freezes pipe lines and as a result power houses are put out of commission. The mine-disability percentage rose in Indiana to 15.7 per cent. and in the Arkansas "anthracite" district to 18.6 per cent. Illinois also lost 9.9 per cent. from mine disability. Pennsylvania with its long outside haulages suffered severely, western Pennsylvania losing 8.6 per cent. of capacity from mine disability and the Panhandle 8.7 per cent.

Labor shortage and strikes except in Illinois, where it caused a loss of 10.1 per cent. of capacity, had little effect on the coal output. Nevertheless the tonnage of bituminous coal for the week fell from 11,118,181 tons to 8,438,549 tons, or 446,605 tons a day. As the miners worked well the sad condition of the output is put squarely up to the railroads and the weather.

WORK SUNDAY AND KEEP CHRISTMAS DAY IN SOUTH

The miners of the De Bardeleben Coal Co. at Sipsey worked on Dec. 23 although that day was Sunday. The men at that mine are ready to make every sacrifice for the needs of the country. Every man in the mine has joined the Red Cross. Dr. George R. Stuart has been addressing the mine workers, urging them to their best endeavors, and Dr. A. C. Williams has addressed the colored employees. Milton H. Fies, resident manager of the company, has always had a lively interest in the material welfare of his men. As a result of his strong sense of social service his men have also a disposition to do their utmost in the present crisis.

Coal miners of Texas and Oklahoma, acting on the suggestion of Fuel Administrator Garfield, that little time be lost because of the pressing need for coal, worked during the holiday season. Miners of Oklahoma and Arkansas placed a request before the union authorities and also before the authorities of the state, asking that they be permitted to work on the Sunday before Christmas so that they might make holiday on Christmas Day and yet not lose a day's work. Their request was granted, and more than half the miners of the fields labored on Sunday as on any other day.

John Wilkinson, president of District 21, United Mine Workers, has suggested to P. A. Norris, State Fuel Administrator for Oklahoma, that a general conference be called at once to include representatives of the Oklahoma railroads, coal operators and coal miners to discuss ways and means for relieving the coal shortage. Mr. Wilkinson will present a proposal for the establishment of shipping zones which will eliminate the waste of transportation facilities in overlapping shipments. His plan will be fully explained at the conference, and it is expected that action will be taken on it.

At a conference in Fort Worth, Tex., attended by coal-mine operators and miners of Texas, all differences in wages and working conditions were adjusted and all danger of a strike in this state was averted. The contract and working conditions adopted in the central competitive fields were approved, the contract being in line with recommendations of the Federal Fuel Administrator.

State Fuel Administrator Crossley of Missouri announces that he will appoint a war fuel board for the state, to be composed of two coal-mine operators and two miners, with himself as the fifth member. Its particular function will be to smooth out differences between operators and miners. He says that he will also appoint a war committee for each mine, on which operators and miners will be represented.

Fight About Penalty Clause Continues

It was somewhat surprising that Frank Farrington succeeded in retaining his office as president of the mine workers of the Illinois district at the recent reelection, but he did so by a substantial majority. Despite his many excellences as a leader of the mine workers and his sterling integrity, there were not a few who opposed him for his support of the automatic penalty clause.

In a recent statement he takes a firm stand in its favor and condemns the disloyal members of the union who find fault with it. He says:

"As for the penalty clause, we have no apology to make for having signed it. No loyal member of our union need fear it. It is necessary to protect the integrity and good name of the United Mine Workers of America against the assaults of the fanatics and enemies who would disgrace and destroy it.

"More than 28,000 members of our union are now in military training camps preparing to defend the democracies of the world against the onslaughts of a ruthless military autocracy, and more will follow in a short time. As never before the nation needs coal to forge the equipment and furnish the means necessary to give them a fighting chance, and a fighting chance is what the loyal members of our union are determined that they shall have."

The statement is in part a reply to a circular issued just before the recent election, charging that Farrington and other named officers were entirely responsible for the automatic penalty clause. This statement was signed by a name that is alleged to be fictitious. Mr. Farrington says that those responsible for the issuance of the circular did not have the courage to affix their names to it and stand sponsor for it so it is obvious that they knew the charge was not true.

The automatic penalty clause is to be invoked for the first time in the central Illinois field by the Springfield District Coal Mining Co. against the 375 miners who struck at the Woodside mine near Springfield against a new system of life checking. W. B. Jess, president of the company, says that fines will be assessed against the men. The men have returned to work under protest on the assurance of Stephen Sullivan, district board member, that their complaint against the new system will be taken up by the state officials of the union.

The system to which the men object is in the interest of their safety, but they do not like it because it enables the company to keep a stricter check on them and makes it more difficult for the miners to "knock off" work ahead of time. Under it each miner is required to hang his card in the office on leaving the mine. At the close of the day the

cards will show whether any men have been left in the mine and if so a rescuing party will be sent below.

It is certain that the men will resist the infliction of the automatic penalty. They are laying the foundation for such resistance now by claiming that instead of striking they were locked out by the company on their refusal to comply with the new order.

Operators and Men Must Cooperate

Wallace Crossley, Missouri fuel administrator, has announced that he will submit to the Missouri Coal War Board some production problems which he thinks should be solved. One of these is the practice of the United Mine Workers of charging a man \$25 to become a member of the union. This keeps many men from entering the mines.

He declares that the failure to provide an equal turn of cars due to the lack of a proper turn bulletin or to the carelessness of the mine foreman is the cause of much loss of tonnage. He urges that a larger output would be obtained if machines were operated by more efficient methods. Time is lost because the coal is not cut, this failure being due to a false economy or to ill-chosen methods of the machine foreman. In other cases machine men and miners lose time because machines are not repaired. This may be due to lack of men and facilities for repairing the machines or to a lack of parts on hand. Again, when the machines are repaired they are sometimes not delivered, as they should be, to the men who are waiting for them.

Sometimes a loss of output results from failure to take coal away from the mines on account of the bad roads. At other times coal-car shortage is to blame or inadequate hauling equipment. Tonnage is reduced also by the bad air in the mines, the system of circulating and regulating the air current being often inefficient and inadequate.

Production would be increased if the miners would cease to abuse the lay-off privilege, if they would stay on the job till their eight hours were completed, if they would not shut down the mines for funerals which, after all, they do not attend, and if they would continue working on election days and holidays of questionable importance, the observance of which the contract forbids. Again, they quit work after starting it if some slight accident to the equipment occurs, which a few minutes would repair, or if some slight grievance arouses them, which grievance should be adjusted without a shutdown as the agreement demands. Many an hour is lost and many a ton fails to be dumped because the committee and the mine foreman waste time in excessive wrangling.

Low Wages to German Miners

The following figures are derived from the *Deutscher Reichsanzeiger*, and they show that the wage of the German mine worker, though largely increased since the war began, is much smaller than that paid in the United States. The high cost of living must make these wages little better than starvation:

NET EARNINGS OF GERMAN MINE WORKERS PER SHIFT IN SECOND QUARTER 1917 WITH INCREASE OVER SECOND QUARTER IN 1914

Mining District	Miners and Trammers		Other Underground Workers		Surface Workers	
	Net Earnings	Per Cent. Increase	Net Earnings	Per Cent. Increase	Net Earnings	Per Cent. Increase
Coal Mines:						
Upper Silesia	\$1.87	60.0	\$1.31	54.9	\$1.17	51.2
Lower Silesia	1.36	41.3	1.19	42.1	1.00	32.5
Dortmund	2.39	61.6	1.59	47.3	1.53	45.8
Saarbrücken (State Mines)	1.95	60.4	1.50	51.8	1.44	55.6
Aix-la-Chapelle	1.92	47.9	1.39	20.5	1.29	30.6
Lower Rhine (Left Bank)	2.30	56.5	1.72	43.9	1.53	44.7
Lignite Mines:						
Halle	1.42	42.0	1.25	45.7	1.20	43.8
Rhine Left Bank	1.63	46.5	1.45	37.8	1.49	52.1

These are the wages paid to men, not women, be it understood. Perhaps they are not the best of workmen, because many of the best men have been called into the service of the army. How a man can live on \$1 a day in Lower Silesia with prices as they are, much less how he can raise a family, is a riddle insoluble. Even the Dortmund wage of \$2.39 paid to miners and trammers, though larger, is inadequate.

FLOYD W. PARSONS, *Editor*

JAMES T. BEARD

R. DAWSON HALL

FRANK H. KNEELAND

EDITORIALS

MCGRAW-HILL COMPANY, INC.—JAMES H. MCGRAW, *President*

Leave Well Enough Alone

NEWS comes repeatedly from Washington that Fuel Administrator Garfield desires to take over the coal mines of the country. If the taking over of the mines would increase production, no one will object, but it is hard to see how matters can be improved.

The mines are able to produce all the coal the nation demands. There has been an unprecedented increase in the capacity of the bituminous mines since the European war began, yet even before the war the mines had such a large output that restriction of production was seriously considered in the interest of the public.

The trouble with the coal supply in the bituminous regions is that the Government railroads cannot remove the coal as fast as the mines produce it. Let the Government, if it can, apply itself to that problem. It will take some years to solve, for the condition of the railroads has been getting out of hand during the long years of Government restriction, so that much work must be accomplished to undo the harm the Government has already done.

The Government explains that its inability to tackle the various problems presented to it is due to the large expansion of the work demanded of it. The explanation is good and is accepted as excusing most of the shortcomings. But that is no reason why we should be willing to put an efficient and adequate business in the hands of the Government. Do we wish to have the Government excuse itself by saying that in mining, as in other matters, it embarked in a new business and one larger than it was organized to handle, and therefore it fell down under the load of it?

There is absolutely no good reason but a labor reason for Government control and, just now, at least, there is only a remote possibility of labor trouble. Never were the mine workers so disposed to work harmoniously and never have they spoken so clearly against Federal control.

The existence of cross-hauling might be advanced as a reason, but this can be corrected at once by breaking present contracts, which can be done, if it be desirable, as well with, as without, Government ownership. New contracts and sales involving cross-hauling can, as in Great Britain, be prohibited.

Breaking Records

NOTWITHSTANDING the many sore spots in our industrial life that have been brought to light by recent investigations, the people of the United States, as a whole, in their war preparations are breaking all records and setting a pace that other peoples will find it difficult to maintain. Statistics covering our many lines of national effort are not public property, but we know enough to be certain that the nation's accomplishments are in keeping with our reputation as

a progressive people and that they are not something of which we ought to be ashamed.

In 1916 the coal mines of America produced a record tonnage. This year our coal and coke output will exceed the 1916 production by upward of 60,000,000 tons. The history of agriculture in the United States this year will provide a similar story. Never before did we produce in the aggregate so much material of food value. The production of steel products this year will reach a tonnage not dreamed of before the war started.

In going to war with America, Germany boasted that this country could add very little to the resistance opposed her by the Allies. How far she was wrong in this conclusion will soon be evident to her. Little by little the vanguard of the American offensive is approaching the German lines. Although separated from us by the broad expanse of the Atlantic Ocean, the Teutons will soon be in contact with a war machine superior to the one she has herself been so long in building.

The number of ships in the war construction program of the navy is 787, including some ships that have recently been completed. This is considerably more than twice the total number of ships in commission on the day war was declared on Germany. In the past year the navy has expanded from 68,000 enlisted men to more than 260,000, including marines, reserves and others in service. In January, 1917, there were 4500 officers. Now there are more than 15,000 officers. The authorized war personnel of the British navy is 276,000. The personnel of the German navy at the beginning of the war was about 80,000.

To prepare its recruits for work at sea, the navy has had to expand enormously its facilities for training. The capacity of its stations and special schools for this purpose has been increased from 6000 to 113,650. Men are being trained in a number of highly specialized trades as well as in the duties of sailor and gunner. The work of a modern army is complicated, but the tasks that have to be performed by the crew of a ship are still more varied. The naval training camps naturally are smaller affairs than the great army cantonments. But one of them, the Great Lakes station, near Chicago, has accommodation for 17,000 men. The new Hampton Roads operating base that has risen almost overnight on the deserted grounds of the Jamestown Exposition has room for 10,000 recruits. The number of naval stations of all kinds has been increased from 130 to 363. The number of employees at regular navy yards in the United States has grown from 35,000 to over 60,000. Counting civilians as well as sailors, the total naval establishment numbers about 340,000 men.

At the beginning of the year there were 300 naval vessels of all types in commission; now there are "many more than a thousand." Ships that were laid up in the navy yards because there were not men enough to man them have been refitted and manned and sent to

sea. Scores of speedy yachts and power boats have been taken over from private owners, to be set at work searching for submarines.

In the past eighteen months Congress has appropriated for naval purposes \$1,905,410,930. This is more money than was spent on the navy in the entire period from 1883 to 1911—the first 28 years of the existence of the "New Navy." And that period includes the years of rapid naval expansion that followed our war with Spain. Expenditures for all naval purposes at the beginning of 1917 were at the rate of about \$8,000,000 a month. Now they are \$60,000,000 a month. The navy is managing a huge system of radio stations. It has taken over all the stations in the United States and the insular possessions. It has recently placed in operation at Pearl Harbor, Hawaii, the most powerful wireless station in the world.

Trebling the number of ships in commission has made necessary great increases in stocks of naval supplies. New warehouses have been built at a total cost of \$10,000,000. The largest of these is eleven stories high, 360 ft. long and 180 ft. wide, and contains sixteen acres of storage space. Seventy 3000-ton steamers could be loaded from its contents. It cost \$1,200,000 and was built in six months.

The navy has fourteen times as many flying boats as it had at the beginning of the year, and thirty times as many men in its aircraft forces. It has built its own aircraft factory in Philadelphia. Ninety days after ground was broken for the plant, the keel of a flying boat was being laid. Five private plants are devoting their entire resources to navy aircraft work.

Last spring the United States Aviation Corps had less than 200 airplanes; now a fleet of 22,000 planes is being built. When war began there were 75 aviators in Uncle Sam's service; at the present moment 10,000 aviators are being trained.

Before any real fighting airplanes could be turned out, a new American industry had to be created. How well this has been done is evident from the fact that instead of the two companies that were manufacturing airplanes when the war started, we now have more than 100 great factories turning out liberty motors, or producing parts that will go to the creation of a vast fleet of fighting airplanes. Just what this will eventually mean is evident when we remember that the automobile factories of the United States produced 4,000,000 automobiles of the 4,700,000 such machines produced in the whole world.

It takes six months to make a flier, and the French tell us that it costs the government \$25,000 to produce a finished aviator. This unavoidable condition may make us a bit slow in getting into the thick of the fight; but if it is true that England is now building at least one plane for every plane being built by the Germans, and that in 1918 Great Britain alone will outbuild the Germans two to one, then the final entrance of America into the battle will surely bring about Germany's speedy defeat.

Uncle Sam is not perfect, and his worthy sons will go on slipping up here and falling down there. However, the nation as a whole is breaking all previous production records, and it need not be doubted that the ultimate outcome will cause us to feel proud of our American citizenship.

One Standard for All

A SOLDIER in khaki and a slacker in civilian dress sat down to lunch in a chophouse. The soldier called for a "cocktail." "Oyster cocktail?" queried the waiter. Whereupon the soldier answered, "No"—very gruffly. The slacker didn't call for an alcoholic appetizer, but if he had he could have obtained it. The waiter's question to him would not have been "Oyster cocktail?" but rather "Manhattan or Bronx?"

Now why this preference for the slacker? Why deny to the fellow who is serving his country, and who may shortly lay down his very life for it, the pleasures granted to the man who is not serving it? The soldier has given up his position; he has surrendered his freedom of action for the greatest of ideals, and there is no reason why others who have not been so generous should not give up with him all that limits their capacity to serve in the rear as he serves at the front.

It is the old story. We say that the man who performs an essential service should be curbed. The soldier, the sailor, the munition maker, the shipbuilder and the miner should be sober; and the others, whose lives are less fruitful or fruitless, or fruitful only in sorrow, pain and waste, shall have their liberties uncurbed.

The railroads and the mines render the American people essential services; therefore curb them, harass them, strictly limit their profits and direct their operations. This is not reasonable. It is time to put a measure of control on everyone. It is time to cut off some of the luxuries of life, and liquor is one of these. It is time also to cut off all harmful industries that turn night into day and simple joys into heaviness.

We have got to make this war mean something to the civilian as well as to the soldier—to make the man who serves war indirectly give as much as he who girds the soldier for the fray. Let there not be two standards, one for the soldier and one for the slacker, or one for the worker in an essential industry and another for the loafer or for the worker in a needless occupation. Sobriety, steadiness, purpose—we must all have them, we must have them all.

For this is democracy; it is universal service. We have no room in America for the needlessly unfit, for addled brain, unsteady feet and nerveless hands. During the war, at least, let us be sober.

If we quote from Kipling "When it comes to slaughter, we must do our work on water," let us not limit it to the man in the fray or to the soldier in uniform behind the lines, but to every man, whether he makes a gun, or the steel of which the gun is made, or the coal by which the iron is smelted, or the pick by which the coal is dug, or the food by which the digger is kept fit for his purpose. As far as sacrifice and sobriety are concerned, the public should know of no civilians.

EACH American soldier in France requires thirty ship tons of transportation annually to keep him an efficient fighter. This means thousands of trainloads of supplies that must be hauled to Atlantic ports. Not a car can move nor a ship cross the Atlantic unless there is coal to fire the boilers. Men of the mines who lay off or lend themselves to a strike today are perpetrating a despicable crime against patriotism.



You can't work
all the time
—but work
when you can

THE Government has taken over the railroads. Whoever helps the railroads is helping Uncle Sam. If the cars are late in the morning, don't be grouchy; if they don't come at all, try and bear it as best you can. Remember, it's Uncle Sam's railroad, and he is trying his durndest to run it so that every one will have work.

AND when the cars are placed remember your country wants you to pitch in and load coal and not quit till the cars are ALL loaded, even if you are going to be idle next day. If you don't load those cars, Uncle Sam wants them for those who will, and he will not leave as many next time. Keep your working face full of coal so that you won't have to dig coal when the mine is running.

LEON
AKER

DISCUSSION BY READERS

Power to Drive Shaker Screens

Letter No. 1—My attention has been drawn to the comparison that J. J. Kienberger has made, *Coal Age*, Nov. 24, p. 905, between the formula I suggested for determining the horsepower of a shaker screen, Vol. 9, p. 609, and that given by W. H. McGann, on page 368 of the same volume.

It will be observed that these two formulas are identical except the coefficient. Both show that the power to operate a shaker screen varies directly as the weight, the cube of the speed of the driving shaft and the square of the length of stroke.

The coefficient, in my own formula, was made large enough to indicate the commercial horsepower of the engine or motor required under the varying conditions of: (1) Poor lubrication of the screen rollers or the driving shaft; (2) overloading of the screen, which is frequently liable to occur in practice; and (3) to give sufficient reserve power for increasing the speed temporarily, should this be required; or to provide against a drop in steam pressure or line voltage.

These are practical considerations in coal mine work, and this is why I said that the formula I gave would yield good results and be entirely safe. In a particular case, however, with favorable conditions, a motor of less power than that given in my formula could be used with safety.

R. G. LAWRY, Assistant Engineer,
Chicago, Ill. Roberts & Schaefer Co.

Bossing and Being Bossed

Letter No. 4—Referring to the question of "Bossing and Being Bossed," one must acknowledge that the situation, today, is a peculiar one. Managers and superintendents, in some cases, find it difficult to secure men who are willing to undertake the responsibilities that go with the acceptance of a position as boss in a coal mine.

During the past year, conditions at the mines have changed wonderfully in this respect. Men who once would have jumped at the offer of a position as mine manager (foreman), or even assistant, are found unwilling today to accept either position, under any conditions. Money appears to be no inducement, for the simple reason that they do not care to be burdened with the responsibility of securing the necessary labor for operating the mine, at this time when men are so scarce.

Indeed, a mine manager (foreman) today might rather be called a "persuader," as there is more persuading done now than bossing. Under present conditions, it is difficult to get sufficient daymen—drivers, motormen, trackmen and timbermen. Everyone wants to dig coal.

The newcomer is willing to take shiftwork only long enough to get some miner to take him in as a "buddy," so that he can gain the two years' experience necessary

to secure a miner's certificate. Great difficulty is found in drilling these new men for the work they have to do, and the boss must exercise much patience with them or he will lose them and they will go elsewhere.

No one can blame this rush of men to "dig coal." We all want to make as much money as we can. The fact that companies do not care to pay more than the scale price for shiftwork makes it difficult to secure men for this purpose and hold them. But, everybody cannot dig coal; someone must do the other work, or the mine will stop running. It is this task that confronts a foreman today and makes his position difficult.

Herrin, Ill.

OSTEL BULLOCK.

Blacklisting to Prevent Mine Accidents

Letter No. 2—Referring to the recent suggestion of James T. Reynolds, *Coal Age*, Dec. 15, p. 1028, allow me to say that the blacklisting of men found guilty of unsafe practices in the mines might cause trouble with the miners' union, and this coal operators generally will wish to avoid. Companies often concede matters of lesser importance from the fear of precipitating a strike among their men. Many a foreman will hesitate to punish an infraction of the mine rules, preferring to overlook the matter rather than incur the ill-feeling of the miner. Foremen know that many miners will gather up their tools and quit rather than pay a fine for an act of carelessness.

This calls to my mind an effective method that was in use by coal operators in France. I believe that the same method, if adopted here, would go farther toward compelling miners to obey the rules and regulations of the mine than the method of blacklisting suggested by Mr. Reynolds. The method proved a success in France, where a miner's record was well known and, in order to secure work at any mine, he was obliged to keep his record clean.

PROTECTIVE AGREEMENT AMONG OPERATORS

An agreement existed between all coal operators binding them never to employ a man who failed to show his record book. He must carry his book with him when making an application for work. The book gave the man's name and description, showed at what mines he had worked and the nature of his employment, together with the dates when he started and quit. The reason for the man's quitting was given and the statement was signed by the mine foreman.

When a man applied for work at a mine he was asked for his record book. This was examined by the foreman, who was thus able to tell exactly what work the man had done and what satisfaction he had given the foremen who had previously employed him. If the report was satisfactory and the man was given work, his book was deposited in the files of the company.

A company would have no right to retain a miner's book, in order to hold him in its employ. It was agreed, however, that when a miner desired to quit, he must give the company three days' notice before doing so. Likewise, the miner was to be given three days' notice by the company if discharged.

One advantage of the record book was that a man who had been driving a mule could not claim that he was capable of running a machine, timbering, or doing other work with which he might be wholly unfamiliar.

The record was also a strong incentive to a man to obey the rules and regulations of the mine where he was employed, as failure to do this would be noted by the foreman in his book and spoil his chances for securing another job at any mine where he might apply. Realizing this fact, a miner always thought twice before disobeying orders.

The book also had a tendency to keep men at work in the same place and destroyed their desire to keep moving about from one mine to another. It was a custom, also, that a miner when joining another local must not only show his transfer card, but produce his record book before being accepted as a member.

BAD PRACTICE IN SHOOTING DOWN ROOF

In my opinion the adoption of this scheme or a similar one would render mine work much more secure than it is at present. An incident that occurred in the mine where I worked, not so long ago, shows the need of men being fully acquainted with the work they must perform. In this instance a company man was sent to shoot the roof down, in my room, in order to provide material for packwalls.

After drilling the hole, the man went for his powder, cap and fuse. Being an old miner, I was much surprised to see him return with three sticks of dynamite, which he laid on the ground. Then, inserting the fuse in the cap, he proceeded to secure it by hammering the edge of the cap with a piece of rock, on the rail. It did not take me long to get on the other side of a car that was standing near-by.

To my question, "Where did you learn that trick?" he replied, "Well, do you think I never fired a shot before?" Pushing the powder back into the hole, he inserted the primer with the fuse attached and closed the mouth of the hole with a piece of old rag, after which he fired the shot. In all my experience as a miner, I had never seen such a shot fired.

The man listened to my explanation of how such a shot should be charged and fired, and then went on his way laughing, as he had other shots to fire in other places. I wonder that the man is still living. The incident, however, may have done him some good, as I saw him, a few days later, going his rounds with a tamping bar in his hands.

In closing, let me say in regard to the record book mentioned previously, that a miner when leaving a mine in good standing had written in his book over the signature of the foreman, "*Libre de tout engagement*"; which translated is "Free of any obligation."

Peru, Ill.

GASTON LIBIEZ.

Letter No. 3—I heartily agree with James T. Reynolds when he says that mine accidents "are chiefly the result of carelessness on the part of miners," *Coal Age*,

Dec. 15, p. 1028; but I doubt very much whether the method suggested by him to prevent the occurrence of such accidents would have the desired result.

Every person interested in coal mining would undoubtedly welcome any method that could be adopted that would effectually reduce the number of mine accidents due to carelessness. I believe that drastic action, in one form or another, should be taken against any and all persons who neglect or refuse to perform the work in which they are engaged.

Such action, however, should not be of a nature that would drive men from the mine and leave them to seek work in other industries where they would still be careless and prove a menace to the men working with them. In my opinion that is what the method suggested by Mr. Reynolds would accomplish.

BLACKLISTING AND THE FEDERAL LAW

If the blacklisting of careless workers was possible, it is still a question whether the law of the United States would permit any action on the part of coal operators that would prevent a man from securing work at any of their mines. An operator certainly has the right to discharge a man who fails to perform his work in a satisfactory manner or disobeys his instructions or violates the mine rules or mining law of the state.

Allow me to suggest that the Bituminous Mine Law of this state, under which our mines are operated, provides for the punishment of any person or persons violating the provisions of the act or the safety rules of the mine. The law makes it a "misdemeanor" for any person to work in an unsafe place knowing it to be unsafe, except for the purpose of making it safe. In the absence of the mine officials, each miner must judge of the condition of his place and it then becomes his duty, under the law, to safeguard himself.

NOT AMERICAN IN PRINCIPLE, OTHER METHODS MORE EFFECTIVE

My opinion is that to blacklist a person for an offense is not truly American in principle. Rather let the mine foreman penalize a miner for carelessness or disobedience. Talk the matter over with him and tell him that the offense must not occur again. If the act is repeated, however, suspend the man for a stated time; be firm; do not fuss with him about the matter. Men will respect a foreman more for such dealing, and it will prove more effective than any blacklisting of careless employees.

An experience of 38 years as a miner convinces me that the man working at the face is not the only careless person employed in and about the mines. The same principle holds true in all industries; carelessness is a human frailty, and it would be difficult to know where to draw the line in blacklisting.

It is true that much has been said and done with the aim of reducing the number of accidents in mines; and much good has been accomplished in this direction, although the results are yet far from satisfactory. As far as my observation and knowledge go, 90 per cent. of the men employed in our mines heartily favor the safety-first movement.

In several districts I know, the miners' local has voluntarily pledged its support to the mine foremen, in enforcing safety regulations in their mines. This

shows that the men themselves are interested in reducing the accident list.

The showing of moving pictures, illustrating how accidents occur in mines and how they may be avoided, has proved effective and is a step in the right direction. Probably nothing that has been attempted has interested the men more generally, in the matter of safeguarding themselves, than these motion pictures, which bring the facts before them in a forcible manner that is not soon forgotten.

In conclusion let me say again: "Enforce the mining law and maintain strict discipline, in the mine, by compelling obedience to the mine regulations and instructions given the men in the performance of their work. Penalize all men who disobey instructions or go contrary to the mine rules. Let the foreman use tact, however, in dealing with such cases.

Where a man violates the mining law, report the case promptly to the mine inspector of the district, who is authorized by the law to take action against the offender. By the use of such methods, I believe, the most good can be accomplished. A MINER.

Punxsutawney, Penn.

Letter No. 4—There is much truth in the remarks of James T. Reynolds, *Coal Age*, Dec. 15, p. 1028, regarding the necessity of adopting effective measures to overcome the carelessness of men working in the mines. The illustration that he gives of the man who scoffed at the safety-first movement and remarked that "men will do as they d— please, anyway," is a common experience with every mine foreman.

Such an attitude on the part of a miner and such a response, or a similar one, to the instructions given him by a foreman, cuts very deep and affects different foremen in a different manner. Instructions in regard to safety are always given by a foreman with a sincere desire to make the work safe, both for the man's own sake and for the protection of the lives of every man in the mine. While some would be angered by the reply of the man and retort in a similar manner, the majority of foremen will let the remark pass and move on to the next place, only to return in a short time to see that the necessary work has been performed.

FOREMEN OFTEN SEVERELY TRIED BY MINERS

In any event, however, there is no doubt that the patience of foremen is frequently severely tried when they feel that their own lives, as well as those of others, are endangered by the attitude of such men. At times, the remark received acts as a damper on the foreman, which he strives to overcome in giving the needed instructions to men in other places.

There is no doubt but something should be done to reduce the number of accidents due to carelessness, though the method of blacklisting suggested by Mr. Reynolds does not appeal to me as the best course to pursue to accomplish this end. I want to urge a more thorough inspection of mines and the maintaining of stricter discipline, by the punishment of those who disobey instructions or disregard the mine regulations and rules for safety. The punishment should be such as to place all careless workers in a class by themselves. The penalty need not be severe, but should be of such

a nature that it will be for the man's interest to avoid doing the same thing a second time.

Violations of the mining law should be promptly reported to the district mine inspector, whose duty it is to prosecute the guilty party by entering a complaint against him. A man who has paid the expenses of a prosecution in court once will not care to incur the same obligation. A court should give its aid to the mine inspector in the performance of his duty under the law, to enable the speedy conviction of the man for the alleged violation of the mine law, and the guilty party should be fined so that he will not be apt to repeat his act.

COÖPERATION NEEDED TO ENFORCE DISCIPLINE

It is my belief that if all mine officials would co-operate in this matter by posting a notice to the effect that, commencing Jan. 1, 1918, all violations of general or special rules will be reported promptly to the district mine inspector, for the purpose of having the guilty party prosecuted and punished, there would be something doing and a change for the better would take place. Not only would less accidents occur in the mine, but there would result a larger output of coal because of the increased safety.

It should be remembered that mine officials are themselves liable to prosecution for not doing their full duty in this regard. I am convinced that a few prosecutions at different places would soon have the effect to arouse careless workers to a sense of their duty to themselves and their fellows in the mine, and good results would follow.

R. W. LIGHTBURN,

West Leisenring, Penn.

Mine Foreman.

Clearing a Heading of Gas

Letter No. 4—I was much amused by the inquiry of Mine Foreman, which appeared in *Coal Age*, Nov. 10, p. 823. The inquirer states that he attempted to remove a body of gas from the face of an entry by hanging a canvas in the return air-course at a point 90 ft. back from the face. This struck me as a joke, especially as he remarks, "The idea, as far as moving the gas was concerned, seemed good." Although he does not say that the experiment was a success, if the gas was not moved he could hardly say that the idea seemed good to him.

The mine where I am employed as mine foreman is a gaseous mine, but we don't try any experiments such as the one here mentioned. Whenever we find gas or observe our ventilation getting a little weak at the face we proceed to remedy the trouble at once. I don't consider gas anything to experiment with in coal mines. The sooner it is removed, the better. I am willing to leave all experiments of that kind with the Bureau of Mines.

Briefly outlined, our method of removing gas, which has always proved successful, is as follows: All entries are driven 10 ft. wide and the track is laid 3 ft. from one rib and 4 ft. from the other rib, the track gage being 3 ft. This permits a row of posts to be set 1 ft. from the rail on the wide side of the entry, so as to provide a 3-ft. air space behind the brattice.

Like Alfred Engell, *Coal Age*, Dec. 8, p. 990, we nail brattice boards at the top and bottom of the posts for

the support of the canvas. In my opinion, however, the 2-ft. space behind the brattice, as described by Mr. Engell, does not appear to me to be sufficient. I believe such a narrow passage would cramp the volume and reduce the circulation of air in that heading, provided the coal is only 6 ft. thick. Assuming a velocity of 200 ft. per min., the volume of air passing would only be $6 \times 2 \times 200 = 2400$ cu.ft. per min. I am of the opinion that the farther the brattice can be placed from the rib of the entry, the better will be the results obtained. I should be glad to see the question of arranging brattices under these conditions further discussed.

McIntyre, Penn.

SAMUEL JONES.

Mass Education Needed

Letter No. 2—What Henry Bock says in his letter on mass education, *Coal Age*, Dec. 8, p. 987, reminds me of an interview with a very prominent mine manager, whose name is familiar in every part of the anthracite coal fields. He said, "Education, conjoined with natural ability, will now and hereafter be the guiding star of mining enterprise."

This saying is very true and, as a proof that technical education is the key that unlocks the mineral treasures of the earth, we have only to notice the skill displayed in the design of machines that reduce manual labor and give better results. The utilization of natural forces in hydraulic mining; the conversion of the power of Niagara into electrical energy and the combination of natural and mechanical forces in the operation of a mine and the preparation of the coal for market, all illustrate the value of technical education coupled with practical experience.

WHAT TECHNICAL EDUCATION HAS ACCOMPLISHED

It is technical education that has made possible the conservation of many natural resources. Coal screenings that, a few years ago, were dumped on the waste heap as worthless, are now being utilized for the production of power. Outcrop coal that was abandoned as unminable, in the earlier days of mining, is now being recovered, by the use of specially designed equipment. Methods of mining and handling coal have been improved and greatly developed as a result of technical knowledge that gave a greater grasp of the forces of nature with which the miner is always confronted.

While it is true that no amount of scientific or theoretical knowledge will fit a man to take charge of a mine unless he has practical experience to guide him, it is just as true that a practical man's capability is greatly increased by a knowledge of the science and theory of mining. Indeed, the future is likely to develop a still greater need of technical knowledge to insure success. Technical education includes not only a knowledge of natural and mechanical forces, but knowing how to apply them in practice; and this is best learned from the experience of successful men. To rely on one's own aptitude, in this regard, would be to work in a comparatively narrow groove.

The up-to-date mining student is progressive. He studies what other mines are doing and observes their successes and failures. The reading and study of descriptions of mining methods and equipment is all right in its way; but much that is written is too general,

and success in practice depends on the manner in which the small details are worked out, in the adoption of new methods and equipment.

At the mine where I am employed, the company changed foremen two years ago. The new man was broadminded and possessed a valuable experience that he had gained in many years of practice. During that time he had visited a large number of collieries to observe their methods and study their equipment. He was a reader of first-class technical literature, and this, together with his keen discernment, has enabled him in two short years to increase the production of the mine 25 per cent., while the cost of its operation has been reduced in about the same proportion. When asked how he did it, his reply was, "By taking advantage of every economical device and method I have seen, and by improving on some of them."

VISITING OTHER MINES TO OBSERVE METHODS

An occasional visit to neighboring districts will seldom fail to bring results to the man who is broadminded enough to recognize that he has much to learn from the experience of others. One of the largest mining companies in the anthracite field has found that the policy of sending an intelligent official on a two weeks' tour of inspection of other operations has proved of great value. This has been shown by the many economical devices and methods employed by that company. Many of these are improvements on similar devices in use at other mines.

Some time ago, the same company sent its superintendent to look at a system of haulage in use at a mine 100 miles away. After a close inspection of the system, the superintendent returned and reported that the only thing about the equipment that he would care to adopt was the detaching hook, which was of special design and just what was needed to increase the efficiency of their own system, which he thought was, in other respects, superior to the one he had visited.

It is freely admitted that the time and money spent in making this visit was repaid to his company many times over, in a few months. This simple incident illustrates how any intelligent mine official, by going on an occasional tour of inspection, will gain much information that will prove a real benefit.

The same truth applies to young men who are studying mining while getting their practical experience working in the mine. Aside from the material advantages derived from technical study is the fact that it trains the intellect and develops a taste for some special branch that may later prove a source of absorbing interest and pleasure.

FRED B. HICKS.

Kingston, Penn.

Relative Size of Intake and Return Airways

Letter No. 1—I cannot agree with the answer given to an examination question that appeared in *Coal Age*, Dec. 15, p. 1033. The question reads as follows: "Which, if either, should be the larger, the main intake or the return airway? Explain why."

The answer states that "under the conditions common to coal mining, the return airway of a mine should have a larger sectional area than the intake airway,"

and gives as the reason the increased temperature of the return air current, and the increased volume of that current, due to the presence of mine gases.

I claim that the haulage road should be the larger airway, regardless of whether it is the intake or the return airway of the mine. My reason is that every car or trip of cars offers a certain amount of resistance to the air current passing on the haulage road. When the haulage is performed on the intake airway, it seems to me that the resistance offered by the cars passing in and out of the mine will overbalance the effect of the increased volume of the return current because of its higher temperature and the gases generated in the mine.

I would be glad to see this question discussed by the readers of *Coal Age*, hoping that more light may be thrown on the matter. The question is to what extent does the movement of the cars obstruct the circulation of the air on the haulage road, and how does this resistance to the flow of the air compare with the increased resistance due to an increased velocity of the return air current, as suggested in the answer given to this question, on page 1033.

Windber, Penn.

F. E. SCHROYER.

Shotfiring in Mines

Letter No. 4—Referring to the letter of Gaston Libiez, *Coal Age*, Dec. 15, p. 1030, I will acknowledge that, in the rather distant past, I shared his view in regard to the explosibility of the gases produced by the combustion of powder in blasting coal. We all realize that it is convenient to go with the crowd or, in other words, to accept too freely the general belief and statements of textbooks, without making a personal investigation and examining critically the proofs offered in support of the theory advanced.

In regard to the question in hand, certain observed facts led me to doubt the correctness of the belief that the mixture of gases produced by the explosion of black powder, and commonly known as "powder smoke," constitutes a highly dangerous element in starting an explosion in a mine. Doubt being once aroused, my further investigation of the matter developed sufficient proof to convince me that the mixture of gases liberated by the explosion of black powder, as stated in my previous letter, "is incapable of promoting or maintaining an explosion." To this statement Mr. Libiez takes exception, but to my mind it is true.

EXPERIENCE IN COAL MINES IN IOWA

When the miners in Iowa fired their own shots, at the end of each shift, and the ignition of the powder was accomplished by the use of squibs, it was necessary to fire the shots in consecutive order. Ordinarily two or more shots were prepared in each working place and all shots following the first had to be fired in the presence of a hot, dense cloud of powder smoke produced by the preceding shot or shots.

This method of firing shots extended through a period of many years, and thousands of practical tests were thus furnished daily, clearly disproving the claim that the gaseous mixture produced by the explosion of powder materially assists in starting a mine explosion if such mixture is exposed to the flame of subsequent

shots. The results of these tests not only proved this claim to be without merit, but showed the fallacy of the belief that greater safety is assured by firing shots in the presence of pure air.

It may occasion some surprise, but the statement is true that when making these tests several explosions occurred when two or more shots were fired consecutively in well-ventilated places that were clear of powder smoke, while no explosions resulted from the firing of a second, third or fourth shot, in places having little or no circulation and where the hot gases of the first shot or shots filled the place.

RESULTS OF A LARGE NUMBER OF TESTS IN MINES

The results of the tests led me to make the statement, in my previous letter, announcing my belief that the presence of dense clouds of powder smoke "will have a decided quenching effect on the flame of an explosion that is already under way."

The circumstance mentioned by Mr. Libiez, and well known to all coal miners, regarding the inflammable nature of the gases confined behind a "standing shot," no doubt is largely responsible for the existing belief in the explosibility of the mixture of gases produced in blasting. While I have lighted the gas under such circumstances a number of times, only feeble flashes were produced, which did no harm.

In order to show that the conclusions drawn from such an occurrence are unjustified, allow me to suggest that the gases confined behind a standing shot are necessarily quite different from the mixture of gases thrown into the air when a shot is fired. Besides the fact that the crevice produced in the rupture of the coal is filled with fine coal dust, it is possible that the flash observed when a lamp is introduced in the crevice is due to a small percentage of marsh gas present to a limited extent in most coals.

WHAT CHIEFLY CAUSES THE FLASH BEHIND A SHOT

That is only a suggestion, because it is my belief that the flash is chiefly due to the volatile matter distilled from the fine coal dust first mentioned. This belief is supported by the fact that there can generally be found small particles of coal in a more or less coked condition, at the bottom of the crack, after flashing the gas confined in the crevice.

Moreover, the narrow space behind a standing shot, being filled with hot gases, acts as a chimney and the fresh air entering at the bottom may form an explosive mixture in this confined space, notwithstanding the weakening effect of the powder smoke that is present. Also, the fact that the flash is generally feeble indicates that the presence of the powder smoke has a weakening effect on the explosion, which would otherwise manifest greater violence.

My belief, therefore, is that while the mixture of gases produced in blasting in a close place is undoubtedly injurious to health and may even prove dangerous to life, it exerts an extinctive effect on the flame of the explosion, owing to the lack of available oxygen. This, in short, is the basis of my belief that a reduced circulation of air in the workings of a mine, at the time of firing, lessens the liability of an explosion taking place.

Chariton, Iowa.

JOHN VERNER,
Former Mine Inspector.

INQUIRIES OF GENERAL INTEREST

Estimation of Depreciation on Stripping Equipment

Referring to the letter of H. B. Miller, *Coal Age*, Nov. 24, p. 902, describing the method of recovering outcrop coal by stripping, I am much interested in learning how he estimates the depreciation in the value of the stripping equipment.

It seems to me that the custom of most companies, when putting in a stripping plant, such as that described by Mr. Miller, would be to figure the entire cost of the plant against a single job, or at least to charge 50 per cent. of the cost of the equipment to the work in hand. This, of course, would depend, to a certain extent, on the size of the undertaking and cost of the equipment required for its completion.

Mr. Miller has allowed \$24 a day for depreciation. Taking his estimate of 1400 tons of coal handled per day, the time required to remove 567,216 tons, in this case, would be a little over 400 days, which would make the total depreciation of equipment charged in this case $400 \times 24 =$ say \$10,000.

This appears to be a small amount to charge for depreciation in such a plant, which Mr. Miller estimates as having a value of \$150,000, including track material of all kinds.

Taking the depreciation as 50 per cent. of the total value of the plant, or \$75,000, according to the custom just mentioned, would make the depreciation, in this case, $75,000 \div 400 =$ \$187.50 a day, instead of the \$24 a day estimated by Mr. Miller. I would much appreciate learning his method of estimating the depreciation in value on this equipment.

B. H. STOCKETT.

Shenandoah, Penn.

The inquiry of this correspondent was submitted to Mr. Miller, whose reply follows:

In estimating the depreciation in the value of an installation, it is my custom to base the estimate on the supposed life of the equipment. In the present instance, I believe that, under favorable conditions and with proper care and upkeep these large-type shovels, worked single-shift, would be good for 20 years of service. I have included the cost for repairs and upkeep in the original estimate, taking this at \$18 per day. The depreciation of \$24 per day, given in my estimate, was arrived at about as follows:

Taking the working days in a year as approximately 313, would give for the total number of days estimated in the life of the machine, $20 \times 313 = 6260$ days. Then, assuming the total cost of the equipment is \$150,000, the rate of depreciation would be $150,000 \div 6260 =$ say \$24 per day. Estimating this equipment as handling 1400 tons per day would make the depreciation $2400 \div 1400 = 1.7c$. per ton.

Before undertaking the installation of a stripping plant for a small acreage, it is my custom to ascertain

if there is other territory to which the equipment can be moved on completing the work in hand. Finding such adjacent territory, I would charge the cost of moving the equipment against the second tract, which would give the first acreage the full benefit of depreciation charges.

Assuming that the acreage, however, was sufficiently large to keep the equipment busy during its entire life, say 20 years, single-shift, or 10 years, double-shift, I would then figure the entire cost of the plant against the one job. Again, if the work would only last 5 years, by double shift, I would estimate the depreciation as 50 per cent. of the value of the equipment, allowing the remaining 50 per cent., to be charged to the next job, with the additional cost of moving the plant. Some contractors figure on a depreciation, per annum, of 10 per cent. of the total cost of the plant, working single-shift.

H. B. MILLER,

Mining Engineer.

Pittsburgh, Penn.

[The above reply answers fully the method used by Mr. Miller in estimating the depreciation in value of equipment, which appears to be equitable.—Editor.]

Shotfiring in British Columbia

While the discussion of shotfiring is absorbing so much attention on the part of the readers of *Coal Age*, because of the importance of the work in respect to the safety of life and property, allow me to ask what regulations govern the firing of shots in the Province of British Columbia. I have been informed that the Coal Mines Regulation Act is very explicit in reference to the handling and use of explosives underground and that, as a result of the strict enforcement of the rules and regulations, accidents in blasting are not frequent. I would like to ask if shotfirers are employed and how the shots are fired.

SHOTFIRER.

Delagua, Colo.

It is true the General Rules of the Mines Regulation Act, under which the coal mines of British Columbia are operated, are very explicit in regard to the use of explosives underground and the firing of shots.

All shots are fired by certified shotlighters. In non-gaseous mines where open lights are used shots may be fired by fuse. The miner can take the powder and fuse into the mine, but the detonators must be carried into the mine by the shotlighters by whom they are issued to the miners at the face when and as required.

In gaseous mines where safety lamps are used all shots must be fired by electric battery. In that case the miner is permitted to take with him into the mine both the electric detonators and the powder; but the shotlighter is the only person who is permitted to carry the battery. The shotlighter on entering a place examines a shothole, and if satisfied that it is safe he oversees the charging of the hole. After firing the shot, he must return and examine the place before permitting the miner or miners to return to the working face.

EXAMINATION QUESTIONS

Miscellaneous Questions

(Answered by Request)

Ques.—At \$50 a ton what would be the cost of the iron required to lay a track $\frac{1}{2}$ mile in length, using 16-lb. iron for that purpose?

Ans.—The length of rail required for a single track, in this case, is $2 \times 2640 \div 3 = 1760$ yd. Using iron weighing 16 lb. per yd., the total weight required would be $1760 \times 16 \div 2000 = 14.08$ tons. The total cost for iron is, therefore, $14.08 \times 50 = \$704$.

Ques.—What quantity of water will be contained in a sump 100 ft. in length, 7 ft. 6 in. in width and 5 ft. 3 in. in depth?

Ans.—The cubic contents of this sump is $100 \times 7.5 \times 5.25 = 3937.5$ cu.ft. Since 1 gal contains 231 cu.in., the capacity of this sump is $3937.5 \times 1728 \div 231 = 29,454$ gallons.

Ques.—Water accumulates at the rate of 200 gal. per min., at the foot of a shaft 600 ft. deep. Power for pumping is available during 8 hours each day. What is the horsepower of the pump that will be required to handle the water in this shaft?

Ans.—Since water flows into the shaft at the rate of 200 gal. per min., the quantity of water that would accumulate in 24 hours is $200 \times 60 \times 24 = 288,000$ gal. A pump that will handle this water in 8 hours must have a capacity of $288,000 \div (8 \times 60) = 600$ gal. per min. Using a standpipe of sufficient diameter to reduce the velocity of the flow of water in the pipe to such an extent as to practically eliminate the friction head, say a pipe 8 in. in diameter, the horsepower required to operate the pump is then calculated from the formula

$$H = 0.00034 Gh$$

$$= 0.00034 \times 600 \times 600 = 122.4, \text{ say } 125 \text{ hp.}$$

Using a 6-in. standpipe, however, will cause a friction head

$$h_f = \frac{G^2 h}{800 d^5} = \frac{600^2 \times 600}{800 \times 6^5} = 34 \text{ ft.}$$

This friction head must be added to the gravity head, making the actual head, against which the pump then operates, 634 ft. The required horsepower, in that case, will be

$$H = 0.00034 \times 600 \times 634 = 129.3 \text{ say } 130 \text{ hp.}$$

Ques.—What would be the difference in the reading of the barometer between the surface and the bottom of a shaft 1000 ft. deep?

Ans.—The reply to this question will depend on the elevation of the place above sea level, if an exact answer is desired. At sea level, under normal atmospheric conditions, one inch of mercury column corresponds to an air column of about 925 ft. in height; while, at an elevation of 2000 ft. above sea level, it is equivalent to 996 ft. Again, in order that the barometric readings shall correctly represent the depth of the shaft, both readings must be taken under the same ventilating pres-

sure, whether the fan is blowing or exhausting. For example, it would not be right to compare a free-air reading on the surface with a reading taken at the bottom of a fan shaft, either a downcast or an upcast shaft.

Assuming the top of the shaft is at sea level, the exact difference of barometric reading between the surface and the bottom of a shaft 1000 ft. deep, for normal conditions as taken from tables is 1.097 in.

It is customary, however, to estimate on each 90 ft. of depth, near sea level, as corresponding to 0.1 in. of mercury, which would make the difference of reading, in this case, $0.1 (1000 \div 90) = 1.1+$ in.

Ques.—What volume of dry air is required to completely explode 350 cu.ft. of marsh gas?

Ans.—For the complete combustion of one volume of methane or marsh gas (CH_4), there is required two volumes of oxygen, as expressed by the equation



In this equation, the numeral preceding the molecule indicates the volume of the gas concerned, and since oxygen forms 20.9 per cent. of pure air, by volume, there is required $2 \div 0.209 = 9.57$ vol. of air to burn one volume of methane.

Ques.—There are 20,000 cu.ft. of air per minute passing along an airway having a rubbing surface of 35,000 sq.ft. and a sectional area of 35 sq.ft. What is the water gage?

Ans.—The water gage, in this case, is found thus:

$$w.g. = \frac{ksQ^2}{5.2a^3} = \frac{0.00000002 \times 35,000 \times 20,000^2}{5.2 \times 35^3} = 1.25 \text{ in.}$$

Ques.—In an airway 72 sq.ft. in sectional area, the velocity of the air is 550 ft. per min.; what will be the velocity of this current where the area is reduced to 60 sq.ft.?

Ans.—For the same quantity of air in circulation, the velocity of the current varies inversely as the sectional area of the airway. In other words, the velocity ratio is equal to the inverse area ratio. Hence, calling the required velocity, for an area of 60 sq.ft., x , we have

$$\frac{x}{550} = \frac{72}{60} = \frac{6}{5}$$

$$x = \frac{6 \times 550}{5} = 660 \text{ ft. per min.}$$

Ques.—What measures would you take to secure the best possible results from a fan, the capacity of which is limited and the demands upon which are close to its capacity?

Ans.—Since the fan is being operated, at present, approaching its full capacity, the circulation in the mine can only be increased by cleaning up all air-courses, enlarging breakthroughs, shortening the course of the air wherever this is practicable, and removing every obstruction to the flow of the air current. Wherever practicable, the air current should be divided into one or more separate splits, which will enable a larger volume of air to circulate under the same power.

COAL AND COKE NEWS

For the Busy Reader

Further authority has been conferred upon James J. Storrow, the fuel administrator for New England. He may now divert coal as he sees fit so as to meet any exigencies that the situation may present.

To cooperate with the Fuel Administration in securing an equitable division of coal, the National Retail Merchants Association has opened an office in Washington. Samuel B. Crowell will be in charge of the Washington office.

A story comes from Newark, N. J., to the effect that a retail jeweler took a job as a coal-wagon driver. He started out with two tons of coal, which he dumped in his own cellar and then resigned, saying the work was too hard.

An announcement made by the New York, New Haven & Hartford Railroad Co. states that during the 11 months ended Nov. 30, the road moved 390,505 more tons of coal over its lines than in the same period of 1916. Of this increase, the larger part was anthracite coal.

Two pounds of seasoned wood have a fuel value equal to one pound of coal, according to experts of the Government forest service. While different kinds of wood have different fuel values, the foresters say that in general the greater the dry weight of a nonresinous wood the more heat it will give out when burned.

That the Fuel Administration adopted a happy thought in its "tag-your-shovel day" is evidenced by the cordial manner in which the school authorities throughout the country are cooperating. The day set aside for this purpose is Jan. 30. The tagging of the shovel of the governor, the mayors and other officials is a distinction to be awarded those who have earned it by having tagged the largest number of shovels.

Had the coal production been continued at the rate to which it had been pushed by the Peabody committee, it would have been sufficient to supply not only the entire coal requirements of this country, but in addition would have been sufficient to create a large surplus to relieve the coal shortage of the allied nations. The foregoing is the salient feature in the report on the work of the Committee on Coal Production sent to Congress by the director of the Council of National Defense.

In the hope of removing the uncertainty as to possible action with regard to coke prices, Dr. Garfield last week made a formal announcement to the effect that there would be no general revision of coke prices during 1918. All contracts and sales of coke dating from Sept. 24 must conform to the Government schedule. Dr. Garfield pointed out that this is not to be interpreted to mean that small outlying operations, where costs are abnormally high, may not be granted exceptions which will permit of the profitable continuance of such production.

In producing the largest amount of coal and coke in the history of West Virginia—80,547,370 gross tons—394 persons were killed and 993 injured among 88,665 persons engaged in the industry, according to the mining statistics for the fiscal year ending June 30, 1917. These figures exceed those of 1916 by 935,072 gross tons; coke was produced to the extent of 2,533,314 net tons, an increase of 575,682 tons over 1916. The gross tonnage of coke the latter year was 1,957,632 and in 1911, 2,694,047. The value of the coke and coal is established at nearly \$183,000,000 and more than \$96,000,000 respectively.

Less coal was carried by the Norfolk & Western Ry. during the month of Novem-

ber last, than during any month since April, 1915, with the exception of February, this year. During the thirty days of the month, 2,434,238 tons of the bituminous product were shipped over this system, as compared with 2,690,016 during the preceding month, and 2,790,178 during November, 1916. Shipments from fields directly along the Norfolk & Western system during November, last, also showed a decrease when compared with the 2,369,026 tons hauled in October, this year, and the 2,271,535 tons carried during the corresponding month of 1916. The total from these fields during the first eleven months of 1917 is 24,800,552, and for the same period of 1916, 25,738,190.

HARRISBURG, PENN.

Presiding officers of the two branches of the Legislature have completed appointment of members of the commissions to study health insurance and to codify the insurance laws. The Health Insurance Commission will meet in Philadelphia, at the call of the chairman.

Senators Beidleman, Dauphin; Weaver, Westmoreland, and Sones, Lycoming; and Representatives Flynn, Elk; Ramsey, Delaware, and Stearn, Philadelphia, were named on the health insurance commission on which Governor Brambaugh named William Flynn, Pittsburgh; William Draper Lewis, Philadelphia, and Dr. J. B. McAllister, Harrisburg.

The inability of coal companies to unload coal cars at Tidewater points due to the low temperature, has caused the side-tracking of thousands of cars of coal in various railroad yards and a tremendous scarcity of cars in the coal regions. The lack of barges to transport the coal to New York and other points has also figured in causing the car shortage. Many of the mine workers contend that the tracks in the various yards of the railroads have been filled for some time by loaded cars waiting to be moved to destination.

The scarcity of the small cars in the mines has also handicapped the miners greatly in increasing the production of coal in some sections. The area of most mines has more than tripled during the last four years but miners say that the supply of mine cars has not increased. The distance a car of coal has to travel from the miner to the surface has greatly increased in many mines, and miners report that cars are so scarce that at various times they are not able to work for at least an hour or two while waiting for another car after one has left them for the surface.

In the bituminous region many of the mine owners continue to blame the railroads for failure to furnish cars and in some of these cases claims have been made that when coal has been shipped it has been held up.

Operators in the Pittsburgh district, for the most part, have completed their November cost sheets and find that production is much more expensive than it has been any month yet under Government fixed prices for coal. Many of the operators assert that if any advance is not granted them soon they will be compelled to shut down their mines. Car shortage is given as the reason for higher cost of production. The operators say their overhead charges are the same if they operate their mines full or in part. The car shortage situation in the district, however, has improved greatly in the last week of the month.

Elimination of cross-hauling is expected to simplify the transferring of coal freight on the railroads. Coal from West Virginia mines will not be taken to Philadelphia, while coal mined in the bituminous section of the state will be shipped south. Every operator will be ordered to ship his product to the nearest market. This will be done through priority orders.

The charges made by Frank C. Reese, a former member of the Legislature from Pottsville, that anthracite operators are inflating their profits by shipping coal to the public containing as much as 20 to 40 per

cent. of slate and bone will be investigated by the fuel administrator.

A call for a more universal use of wood for fuel, as advocated by the Federal Fuel Administration, was made the subject of a statement of Mr. Potter on Dec. 31.

Through a slashing of its passenger service, by order of the Government as a war measure, the Philadelphia & Reading Ry., on Jan. 1, will virtually cease as a passenger-carrying road, and will be used until the end of the war as one of the principal freight carriers of the East.

In the vast scheme designed by the newly created Federal War Board at Washington, the Reading, in the broad sense of the war, will lose its identity and will be merged into the great system of railroads under strict Government operation.

The decision to convert the Reading came with unexpected suddenness even to its officials. One official expressed himself, as saying, "the very heart of things was ripped out bodily." Large schemes are in prospect, among them the using of the Reading line from Harrisburg to New York as a short cut to relieve the congestion on the main line of the Pennsylvania. It is understood that much of the freight from the West going over the Pennsylvania will be switched off at Harrisburg to the Reading lines, where it will be carried into New York by way of the Reading, Allentown and thence over the Jersey Central or the Lehigh Valley.

The most important use to which it is expected the Reading will be utilized will come in handling a major part of the coal business. The Reading is the largest anthracite-carrying road in the country. Its 1100 miles of track reach practically the richest coal beds in the state. Strategically situated, it can shoot its product into any center. It has a direct line to Philadelphia; it can reach Chicago and the West by its connections with the New York Central; New York over both the Lehigh Valley and New Jersey Central, which it controls. It can ship to New England or to the South with almost equal ease, either by rail or water.

The first real evidence of Federal control of railroads came on Dec. 31, when the Delaware, Lackawanna & Western R.R. hauled over its line 200 trains of empty Erie coal cars from Bergen Junction to No. 6 Junction, just outside of Scranton, and there turned the cars over to the Erie to be loaded at the mines of the Erie company.

PENNSYLVANIA

Anthracite

McAdoo—It is reported here that the Lehigh Valley Coal Co., which a score of years ago operated the York Farm colliery, in the western part of Schuylkill County, abandoning it because of excessive water and gas, purposes shortly to start removing the culm banks, which, it is estimated, are worth a half million dollars. Repeated efforts have been made by private interests to get possession of these banks, which contain valuable sizes. The Lehigh Valley Coal Co. has but one other interest in the lower anthracite field and that is at Blackwood, several miles further west. This is a profitable operation, which ships annually between 300,000 and 400,000 tons.

Minersville—The Heilner culm bank is to be utilized by the Philadelphia & Reading Coal and Iron Co., which has already installed a steam shovel for the purpose of removing the deposits, which contain much valuable coal of steam sizes, from the Wolf Creek branch to the Schuylkill Haven and Pine Knot breakers, for preparation for market. Valuable banks directly in the town of Minersville near the high school building are also to be removed.

Reading—Reading coal dealers have been given a jolt by local Fuel Administrator Acker, who ruled that persons buying coal and having it hauled away in their own wagons or at their own expense must get a 60c. instead of 25c. discount per ton. The dealers said it cost them \$1.50 to deliver a ton of coal, but allowed only 25c. to persons who brought their own vehicles. The allowance of 60c., though better than 25c. a ton, means nothing to the average

consumer. He could not begin to get a man to haul his coal for \$1 a ton, vehicles for hire being scarce.

Georgetown—A big drive on the mine workers started on Dec. 26, and will continue for some time, during the payday period. The unions are enthusiastically back of the Red Cross, and have offered to help the movement, and are making an effort to have every union member join the Red Cross. The Lehigh & Wilkes-Barre Coal Co. has requested a thousand more buttons to use along with the 5000 it has already taken.

Shamokin—The fire at the Susquehanna Collieries Co. s Scott mine, believed to have been extinguished Christmas morning, broke out afresh early on Dec. 27 and is raging fiercely in a solid pillar of coal. An entire section of the mine will be sealed off to smother the flames. The fire is 1800 ft. below the surface, in No. 4 vein, a gaseous portion of the mine. It is the belief of the officials that the fire ate its way through a small leader beyond the range of the heavy streams of water. There, fanned by the air currents, a serious fire developed, necessitating a change of fire-fighting tactics. Once the fire district has been sealed, the company will place the men thus idle in other portions of the mine, in order to keep up the colliery production.

Lansford—The men employed by the Lehigh Coal and Navigation Co. throughout the Panther Creek Valley to work in the mines and collieries, at monthly salaries, received increases of 25 per cent. when the miners received an increase of 35c. a ton for coal mined. The Susquehanna Collieries Co. on Christmas Day presented its office employees and engineers with checks ranging from \$10 to \$200.

Wilkes-Barre—A washhouse in the yard of the South Wilkes-Barre No. 5 colliery was slightly damaged by fire on Dec. 27. A call was sent in for the city fire department to protect the large breaker, but the fire was put out by the miners before going inside the mines.

Mount Carmel—Through the scarcity of male labor at the mines of the Susquehanna Collieries Co., Mrs. Cora Van Gasken becomes the first weighmistress in the anthracite region. Mrs. Van Gasken has been placed in charge of weighing coal at the Cameron colliery. At the same time the company announced the appointment of seven other women and girls in clerical positions.

Edwardsville—The Kingston Coal Co. on Christmas Day presented scores of children and widows of miners who had been killed in the mines of the company with cash donations, sweaters, reefers, gloves and other articles of clothing.

Bituminous

Holidaysburg—James Hutton, Sr., a Philadelphia banker, on Dec. 26 purchased the Homestead mine in Clearfield County. Its output of coal will be solely used to keep the big dye plants in Philadelphia going. Other Philadelphia manufacturers, impelled by the coal shortage, are negotiating the purchase of coal mines in the Allegheny Mountains.

Phillipsburg—While the miners' union of Beccaria was meeting on Dec. 24, an attempt was made to blow up the building in which the miners were assembled. The explosion, which did much damage to property in that vicinity, must have been premature. A number of miners found a 12-ft. fuse sputtering its way toward several sticks of dynamite.

Heshbon—The first shipments of coal from the new Stanley mines of the Stanley Smokeless Coal Co., at Dias, were made the past week. It is located on the Cambria & Cresson branch of the Pennsylvania R.R. and shipments can be made via P. R.R. and B. R. & P. John Madill, formerly with the Savan Colliery Co., is general superintendent of the new company. A store building and 25 miners' houses have been built.

Connellsville—The Clark Coal Co. has purchased and taken over all the holdings of the Smithfield Coal and Coke Co., at Outcrop. The deal includes about 100 acres of coking coal, 34 coke ovens and the entire mining plant. E. C. Higbee is president of the new company.

Indiana—Vernon F. Taylor, of this city, has sold two of his new operations. The Caldwell Smokeless Coal Co. mine and the Black Lick Coal and Coke Co. mines located on the Black Lick branch of the Pennsylvania R.R. have been sold to Campbell, Peacock & Kinzer, of Philadelphia. The new owners will enlarge the plants and greatly increase the tonnage of both mines. The consideration was not made public.

Plumville—It has just been made public that the Consolidated Coal and Coke Co. has purchased 31 tracts of coal land in South Mahoning and Washington townships, Indiana County, containing about 5000 acres of coal. The company has also purchased several houses in Plumville and the surface of the A. H. Miller heirs' farm, where it will erect a modern mining town. Work has been started on the construction of a siding connecting with the Buffalo & Susquehanna R.R. The considerations were not made public. Wallace B. Chapman, of Indiana, Penn., is local attorney for the new company.

WEST VIRGINIA

Teter—The electrical plant of the Pleasant Valley Coal Mining Co. is practically completed. It is expected that the plant will soon be in operation.

Downs—Some fine miners' houses are being erected by the Bertha Coal Co. at its plant near Downs, Marion County. About 75 houses are nearing completion. A total of 225 houses are to be erected.

OHIO

Lectonia—A mysterious fire at the Delemore mine is being investigated by Federal agents, it is reported, on the theory that the fire was caused by alien enemies. The blaze destroyed the power house at the mine and crippled the operation to such an extent that it was necessary to close down for the time, thus eliminating 250 tons daily production. The fire was similar in its starting place and effect to several other blazes which have destroyed coal-mining equipment and machinery, forcing shutdowns, and Federal authorities are becoming aroused. Operators are now being urged to throw armed guards around their properties.

Parlett—The Wayne Coal Co. held a Christmas tree celebration and entertainment for its employees and their families Saturday evening. H. D. Patterson, general superintendent of the company, delivered an address, thanking the men for their cooperative service. A band from Cadiz, Ohio, and a quartet from Pittsburgh furnished music. Every one of the 600 guests received a gift at the close of the celebration.

INDIANA

Brazil—The new mine of the American Coal Co., of this city, which is being sunk south of Bicknell, will be the largest in the state and will have no boiler house. The machinery will be operated by electricity supplied from a power station at Edwardsport. The mine will have a normal daily capacity of 5000 tons, as compared with 3000 tons a day, the normal capacity of the present American Coal Co. mine No. 1, southwest of Bicknell.

ILLINOIS

Carlinville—Construction work at the proposed site of the two new coal mines of the Standard Oil Co., six miles northeast of Carlinville, is progressing favorably in spite of the cold weather. A gang of Italian workmen are engaged in laying and surfacing tracks from the Chicago & Northwestern R.R. to the yard tracks of the proposed mines. Houses are to be built to quarter the laborers during the period of construction. A boarding house and commissary will be installed as soon as the houses are finished.

Cuba—The work of opening the coal mine on the Lacky & Vliet farm is progressing nicely. William Gagg is superintending the work. A large amount of coal has been located in the vicinity of the mine.

Christopher—A commission has been appointed to investigate the recent explosions that have occurred lately in the coal mines of southern Illinois. The personnel of the commission is as follows: Coal Operators—Rice Miller, of Hillsboro; James Forester, of DuQuoin; and Archibald McLaren, of Marion. Miners—Ben Firth, of Gillespie; T. J. Reynolds, of Collinsville; and Thomas Clayton, of Benton. Department of Mines and Minerals—Frank Rosbottom, of Benton; Joseph Thompson, of Murphysboro; and T. Bannister, of Herrin.

Zeigler—The Zeigler mine, in which an explosion occurred three weeks ago, killing 17 miners, has been sealed since the explosion and, according to Evan John, director of mines and mining, cannot be reopened for about two weeks. Seven hundred men are out of work. It is expected that the Christopher mine, in which there was an explosion more recently, will be ready for reopening in a few days.

Stanton—The Consolidated Coal Co., threatened with water shortage by the ex-

haustion of its reservoir supply, is sinking wells in the hope of obtaining a sufficient supply, and is also preparing to pipe water from Cahokia Creek.

Edwardsville—Drills have been placed in operation on the farm of Rudolph Frickenstein, east of here, in a large development enterprise financed by a syndicate. Six borings have been made, but the results will not be divulged until the data have been laid before the syndicate members for final action. The tract on which operations have been taken contains about 12,000 acres.

Granite City—Steps are being taken to organize a cooperative society and open a store here. Duncan McDonald, secretary of the Central States Cooperative Society, is advising with local union leaders.

Foreign News

Brantford, Ont.—A municipal coal-distributing office was opened on Dec. 24 under control of an Advisory Committee, on which the coal dealers are represented. All consumers must obtain orders from the municipal office on a dealer and none are served who have more than a week's supply on hand. Orders are only issued for one ton to one-quarter-ton lots. Purchasers are permitted to name their dealer and if he has none on hand the order is placed with the nearest point of distribution.

Toronto, Can.—The Canadian Board of Railway Commissioners at Ottawa has given a decision authorizing a general increase in freight and passenger rates. The reason assigned is the higher cost of coal labor and materials. Passenger rates are increased 15 per cent. with the exception of British Columbia, and freight rates approximately 10 per cent. in the West and 15 per cent. in the East, subject to certain specific limitations. On coal a flat increase of 15c. per ton is allowed, it being considered that this will bear less hardly on the consumer than a percentage increase. In the Western hearings held by the Commission the evidence was to the effect that a flat increase was preferable to the percentage asked by the railways. The date on which the increased rates will come into effect is not specified, as the railways will have to file new tariffs based on the judgment which must receive approval. This may require some weeks.

Berne, Switzerland—In anticipation of having to struggle along with 200,000 tons of coal less a month, the Swiss Government has cut to the bone the railroad traffic, raised rates and made it so difficult and so expensive to travel that only necessity is apt to induce a Swiss to move from one part of his tiny country to another. This step is due to the fact that Germany's initial delivery for September, under the new economic agreement, has fallen many thousands of tons short of the promised minimum of 200,000. The Swiss government also has issued drastic regulations concerning heating. The sale of certain types of electric stoves was forbidden, while electricians were forbidden to install new switches and lines such as would be necessary for utilizing stoves. Hotels and mansions may heat only one-quarter of their rooms and must close their cafes and restaurants at 11 instead of 1 o'clock. The hours of opening stores are reduced.

Personals

H. K. Stauffer, who has been associated with B. Nicoll & Co., 149 Broadway, New York City, as special agent, in charge of the concern's Johnstown office, has been appointed manager of the Pittsburgh office.

F. E. Bedale, Mount Pleasant, Penn., has been named inspector of bituminous coal mines for the compensation insurance authorities at Johnstown. Mr. Bedale succeeds Malcolm MacDougall. Headquarters will be at Harrisburg.

Charles Hall, secretary of the Indiana Coal Bureau, with offices at Terre Haute, Ind., has resigned his position, effective Feb. 15. He has been chosen head of the Bledsoe Coal Co., of Terre Haute. His successor has not yet been selected.

A. S. McQueen, of B. Nicoll & Co., 149 Broadway, New York City, has resigned his position with that firm to take up business on his own account. He will be associated with W. W. Keefer, First National Bank Building, Pittsburgh, Pennsylvania.

W. S. Blythe, of Homer City, Penn., superintendent of the Tide Coal Mining Co., has been promoted to general superintendent of the mines of the Tide Coal Mining Co. and the Coal Run Mining Co. mines. Mr. Blythe will have his headquarters at Indiana, Pennsylvania.

George S. Cokley, superintendent of Cummings shaft, of the Jefferson and Clearfield Coal and Iron Co., has been made superintendent of the mines of the Tide Coal Mining Co., at Homer City, Penn. Cummings shaft has been placed under the supervision of W. M. Downer, superintendent of the Ernest mines, of the Jefferson and Clearfield Company.

Joseph Cochran, formerly superintendent of the Burrell mine, at Firestone, Colo., has accepted a like position at Klondyke mine, of Pike View, Colo. Mr. Cochran is a mining engineer of considerable experience. He had charge of the Puritan mine during the sinking and equipping, and was then transferred to the Monarch No. 2 mine, owned by the same company, the National Fuel Co. At the examination held in Denver last July for mine inspector, Mr. Cochran was second highest in percentage.

Obituary

Paul B. Cosgrove, partner in the firm of Cosgrove & Co., one of the best-known coal-operating organizations in the country, died Dec. 21, in Johnson City, Ill. Mr. Cosgrove, though only 23 years of age, held an enviable place in the coal world. He is survived by his mother, a sister and three brothers.

James A. Phillips, of Cleveland, Ohio, who was recognized as a man of honor and integrity among the coal dealers of Ohio, passed away on Wednesday, Dec. 26. Mr. Phillips was at one time manager of the Windsor Coal Co. and the Steiner Coal Co., and for the past three years had been with the Lake City Coal Co. His death is keenly felt by his friends and business associates.

John Thomas Morgan, president of the East Pratt Coal Co., of Birmingham, Ala., died at his residence in that city on Dec. 25, after a brief illness. Mr. Morgan had been in the Birmingham district for the past 40 years, most of which time he was engaged in the development of coal-mining interests, and owned valuable coal lands in Bibb County in addition to properties of the East Pratt Coal Co., in Jefferson County, on which is located the Cliff mine.

Lafayette Lentz, aged 89, a prominent resident of Mauch Chunk, Carbon County, Penn., and well known throughout the anthracite coal region, died on Dec. 29 of general debility. He was born in Northampton County, but spent nearly all his life in the Panther Creek Valley. Mr. Lentz had a wide reputation as a coal operator and railroad builder, doing most of the work in driving tunnels for the Lehigh Valley R.R. and successfully completing contracts for several other large railroads. In 1868 he became extensively interested in coal-mining operations and was active in the firm of Lentz, Bowman & Co., Lentz, Lilly & Co. and also the firm of L. A. Riley & Co., operating mines at Park Place.

New Patents

Briquetting Machine. T. Gilmore, Jr., assignor to General Briquetting Co., New York, 1,247,667. Nov. 27, 1917. Filed Feb. 6, 1917. Serial No. 146,873.

Fuel Saver and Smoke Consumer. L. D. West, Denver, Colo., 1,247,761. Nov. 27, 1917. Filed Nov. 15, 1916. Serial No. 131,416.

Dump Car. W. L. Burner and J. D. Benow, assignors to Kilbourne & Jacobs Manufacturing Co., Columbus, Ohio, 1,247,412. Nov. 27, 1917. Filed Jan. 8, 1917. Serial No. 141,252.

Furnace Construction. C. A. Hammel, Los Angeles, Calif., 1,248,321. Nov. 27, 1917. Filed Oct. 9, 1916. Serial No. 124,635.

Mechanical Stoker. G. O. J. Kleven, Salt Lake City, Utah, 1,247,969. Nov. 27, 1917. Filed Nov. 15, 1916. Serial No. 131,575.

Ventilated Interlocking Clinker Bar for Furnaces. O. C. Woolson, New York, N. Y., 1,248,048. Nov. 27, 1917. Filed Aug. 10, 1916. Serial No. 114,117.

Automatic Stopping and Releasing Device for Mine Cars. G. M. Johnson, McDonald, Penn., 1,249,106. Dec. 4, 1917. Filed July 6, 1917. Serial No. 178,998.

Coal-Delivering Apparatus. G. W. Freeland, assignor to Williams, White & Co., a corporation of Illinois, 1,248,473. Dec. 4, 1917. Filed Oct. 10, 1914. Serial No. 866,008.

Publications Received

Cost Accounting for Oil Producers. By Clarence G. Smith. Department of the Interior, Bureau of Mines. Bulletin 158. Petroleum Technology 43. Unillustrated, 117 pp., 6 x 9 1/4 in.

Blast-Furnace Breakouts, Explosions and Slips, and Methods of Prevention. By F. H. Wilcox. Department of the Interior, Bureau of Mines. Bulletin 130. Illustrated, 267 pp., 5 1/2 x 9 1/4 in.

New Tertiary Mollusca Occurring in New Zealand. Accompanied by a few notes on necessary changes in nomenclature. Part I. By Henry Suter. New Zealand Department of Mines. New Zealand Geological Survey. Palaeontological Bulletin No. 5. Illustrated, 93 pp. of text and 13 plates, 8 1/2 x 11 in.

Industry, Society and the Human Element. A Few True Detective Stories That Are Interesting and Instructive. Sherman Detective Agency, Inc. Illustrated, 80 pp., 6 1/2 x 9 1/4 in.

This eighty-page book explains the successful methods which Mr. Sherman employs in eliminating discord and promoting harmony between employer and employee. It contains many features valuable to executives at this time and will be sent to executives who request it on their corporation's letterhead. The main offices of the "Sherman Service" are at 20 Broad St., New York City; 208 So. LaSalle St., Chicago, Ill.; 10 State St., Boston, and 42 Church St., New Haven, Conn.

Industrial News

Harrisburg, Ill.—The Saline Gas Coal Co. has been incorporated with a capital stock of \$150,000. The incorporators are John H. Crawford, Homer Collier and J. M. Hunsaker.

New York, N. Y.—At a meeting of the board of directors of the Worthington Pump and Machinery Corporation, 115 Broadway, New York, C. P. Coleman was elected as the company's president.

Lincoln, Ill.—The Logan County Fuel Committee has allowed an increase of 30c. a ton for coal at the mines of the county, for local use, making the price \$2.95 instead of \$2.65. The delivery charge is 60c. a ton.

Columbus, Ohio.—The Olmstead Coal and Mining Co. has been incorporated with a capital of \$125,000 to mine and sell coal. The incorporators are R. E. Westfall, E. K. Merwine, N. K. Bales, A. G. Price and James Judge.

Gowan, Okla.—The No. 2 Coal Co. has been organized with a capital stock of \$10,000, for the purpose of developing some coal-land leases in this section. The incorporators are W. K. Hudson, W. H. Watson and J. G. Anderson, all of Gowan.

Niantic, Ill.—The Carbon Coal Co. has applied for incorporation papers in Illinois. The capital will be \$100,000. David W. Beggs, Jessie M. Corzine, Frank D. Shields, Daniel Macknet, Chester W. Russell and Benjamin W. Waggoner are interested.

Columbus, Ohio.—Ohio operators are now working on the priority order of Ohio Fuel Administrator Johnson, which compels operators to load for public utilities, state and county institutions and domestic users until a two weeks' supply has been obtained.

Flemington, W. Va.—The Aster Coal Co. has been incorporated with a capital stock of \$50,000 to operate mines in Taylor County. The incorporators are D. J. Carter, Harry W. Sheets, C. E. Cocke, B. B. Jarvis and G. D. Derituc, all of Clarksburg, West Virginia.

Grafton, W. Va.—The Liberty Mining Co. has been incorporated with a capital stock of \$20,000 to operate mines at Powell, Marion County. The incorporators are Edmund L. Sawyer, David L. Ross, John J. Henchener, Hugh Warner and Jed W. Robinson, all of Grafton.

Columbus, Ohio.—The Ohio Public Utilities Commission has issued orders for railroads to supply wagon mines with open-top equipment. Previously orders were issued to supply only box cars to wagon operations. There are approximately 700 wagon mines in Ohio.

Athens, Ill.—The Athens Coal Mining Co. has been incorporated under Illinois law to mine and sell coal, lease, purchase and deal in coal lands and coal rights and to transact a general mining business. Joseph Hann, S. H. Cummings and Thomas W. Kenyon are the directors.

War, W. Va.—The Underwood Pocahontas Coal Co. has been incorporated with a capital stock of \$100,000 to operate mines in McDowell County by H. M. Burke, F. W. Truscott, of War; C. H. Truscott, of Cleveland; George Morrow, of Charleston, and J. E. Jones, of Switchback, West Virginia.

Bokoshe, Okla.—The Gunther Coal Co. has been organized and its charter has been filed in the office of the Secretary of State at Oklahoma City. The company is capitalized at \$100,000 and the incorporators are: A. P. Gunther, of Kansas City; E. R. Jones and L. W. Randolph, of Muskogee.

St. Louis, Mo.—State Fuel Administrator Crossley has issued orders that coal cars reaching St. Louis in the morning must be unloaded the same day and the railroads must haul the empties away that night. Coal dealers are asked to report failure of the railroads to promptly remove the empties.

Hillsboro, Ill.—The coal properties of the Chicago & Eastern Illinois Railroad Co. were sold under foreclosure recently in favor of the Central Trust Co., of New York. The holdings consisted of two mines at Witt, Ill., and was bid in by the trustees for the bondholders, for debt, interest and costs.

Springfield, Ill.—The Sangamon County Fuel Committee has fixed \$3.75 as the maximum price to be charged consumers, made up as follows: Price at mouth of mine, \$2.65; allowance to operator for delivery at wagon chute, 30c.; delivery to consumer, 80c. The price has been approved by State Fuel Administrator Williams.

Pemberton, W. Va.—The Beard Smokeless Coal Co. has been incorporated with a capital stock of \$100,000 to operate mines in Shady Springs district, Raleigh County. The incorporators are Prince E. Lilly, John R. Hornbrook, of Lillybrook, W. Va.; C. E. Lilly, of Floco, W. Va.; Frank Beard and Estel Bryant, of Pemberton.

Charleston, W. Va.—A corporate charter was issued by the Secretary of State to the Cabin Creek Block Coal Co., of Ronda, W. Va., to operate mines in Kanawha County; capital stock, \$100,000; incorporators George W. McClintic, W. G. Mathews, B. Stanley Gill, J. R. Hayes and B. D. Truslow, all residents of Charleston.

Coulterville, Ill.—The McKinley Coal and Mining Co. will install a million-dollar plant in this vicinity, where it has 1666 acres of land. The company has two veins of coal, running 6 ft. deep. The mine will be on the Illinois Southern R.R. and will be two miles from the Illinois Central. From 3000 to 4000 tons a day will be mined.

Lima, Ohio.—Because of a shortage of coal, the entire City of Lima has been in darkness for a week. The electric-light plant was compelled to shut down, and as a result all street lights and lights in 2000 homes were turned off. There was considerable suffering from lack of coal reported in certain sections of the city.

Norton, Va.—The MacClanahan Coal and Coke Co. has been incorporated with a capital stock of \$30,000 to operate mines in Wise County, Virginia. The incorporators are William MacClanahan, of Tralee, W. Va.; K. S. MacClanahan, of Amigo, W. Va.; F. S. Kits, of Beckley, W. Va.; Eli Noneff and W. S. Thompson, of Mullens, West Virginia.

Clayton, Mo.—St. Louis County coal dealers are getting just about half the cars of coal that are shipped to them. Since Dec. 1, according to Samuel Hodgdon, chairman of the County Fuel Committee, the dealers have received 63 cars, and 64 cars are in transit. He says that a car loaded at Herlin, Ill., for the Clayton Supply Co. has been on the tracks there 21 days.

Buffalo, N. Y.—In connection with the taking over of the Niagara Falls water-power plants, it is stated that the Government has asked the Buffalo General Electric Co. to build on the Niagara River below this city a 50,000-hp. steam plant in addition to the one which it already has there. All will be used to generate electricity for operating street railways and electric-light plants.

Pana, Ill.—State Fuel Administrator Williams and County Fuel Administrator Hoover have been investigating alleged excessive charges by the three Pana coal-mining companies. Testimony has been taken under oath and comparison is to be made with rates charged elsewhere. It is alleged that

the companies have been charging more than companies at Staunton, Gillespie and Springfield.

Fairmont, W. Va.—Coal men of Fairmont and vicinity gathered at the Fairmont Hotel, Jan. 2, when a club was organized similar to those existing at other coal centers. It is to include coal men from every mine in Marion County and nearby points, who will dine together once a week with a view of exchanging ideas. A. Brooks Fleming, Jr., of the Consolidated Coal Co., was active in the formation of the club.

Reading, Penn.—Ernest J. Poole, general superintendent of the Carpenter Steel Co., has sent to every one of his 2200 employees who in any way handles fuel a letter asking him to aid in a program of coal saving. The company is working night and day. It must have 5000 tons of coal a month, and in the face of a serious shortage every fireman, heater or other man who uses a coal shovel is asked to use the utmost care.

Columbus, Ohio—Mayor Karb, of Columbus, has vetoed the ordinance providing for the establishment of a municipal coal yard. The ordinance was fathered by Councilman Zimpfer, a Socialist member. It provided for the location of the yard on a site between the Hocking Valley and Toledo & Ohio Central tracks. In his veto Mayor Karb said that he believed the Columbus pool will be sufficient to take care of Columbus.

Wheeling, W. Va.—The Liberty Transit Co., organized recently to operate boats and barges on the Ohio River, has completed its organization by the election of J. C. McKinley, president; Charles M. Ketchum, secretary, and Robert Hazlett, treasurer. A long list of directors has been selected. It is planned to operate boats for the transportation of coal and other badly needed commodities. Operations will be started in the early spring.

Benton, Ill.—The Murphysboro & Southern Illinois Railway Co. has made application to the Illinois Public Utilities Commission for permission to issue \$63,000 capital stock and \$250,000 in bonds to meet the cost of extending the line from Carbondale to Cartersville, connecting with the Coal Belt line, or to extend the line on to Herrin through the rich coal fields of Williamson County. The road is now in operation between Murphysboro and Carbondale.

Cincinnati, Ohio—The final decree of the United States District Court in the case of the Otto Marmet Coal and Mining Co. against Dredgeboat Northern No. 2, with the other parties involved, has been handed down, confirming the report of the special master appointed, and finding that the Marmet company sustained damages of \$2775.93, while the dredging company sustained damages of \$1663, to be paid by the Marmet company. Costs are divided.

Alton, Ill.—The Alton Fuel Committee has announced that in determining the prices which retail dealers will be allowed to charge for coal the following allowances will prevail: For wastage and steelage, 16c. per ton; for delivery, 75c. per ton; for overhead, 50c. per ton; for net profit, 25c. per ton. As it costs \$3.34 a ton for coal on track at Alton, this means a retail price of \$5 a ton. An extra cent or two per bushel will be allowed on sales in smaller quantities.

Columbus, Ohio—The Stalter & Essex Co., of Columbus, has filed charges against the Kanawha & Michigan R.R., alleging that during the month of December only 73 cars were supplied to the mines of the company, which have a capacity of 100 tons daily. It is claimed that other mines on the road have the same percentage of cars and discrimination is not charged. It is charged, however, that the road discriminates against Ohio mines in favor of West Virginia operations.

Morea Colliery, Penn.—The Dodson interests have combined their bituminous, anthracite and real estate purchasing departments under one management. These are now located in the company's new office building at 26 South New St., Bethlehem, Penn. P. J. Malloy will remain purchasing agent, and J. B. Connell, previously general superintendent of Morea and Beaver Brook collieries, is now general purchasing agent and manager, with offices at Bethlehem.

Cincinnati, Ohio—Several local coal companies, including the Reliance Coal Co., as well as several large industrial consumers, have complained of the action of Wiley B. Bryan, of Louisville, Kentucky fuel commissioner, in confiscating in Kentucky coal consigned to them, charging that this action has resulted in suffering in Cincinnati. The matter will be carried direct to the Federal Fuel Administration in order to

prevent further diversions of Kentucky coal en route to Cincinnati.

St. Louis, Mo.—St. Louis coal operators have donated 26 cars of coal to be distributed to the city's poor. The donations were obtained by a committee of the St. Louis Coal Club, of which John Henderson, of the West Virginia Coal Co., was chairman, and reported to E. J. Wallace, secretary of the club. The value is between \$3000 and \$3500 at the mine, freight \$780 and delivery \$520. Jobbers are to absorb the freight charge and dealers will make the deliveries free on the orders of the charity organizations.

Columbus, Ohio—The Columbus Coal Shippers' Terminal Pool Association, of which B. F. Nigh is manager, was launched Jan. 1. Blanks had been sent to all shippers to the pool and offices were opened in the Brunson Building. C. W. Pinney, an expert railroad man, was selected as chief assistant to the director. Charles Moriarity, the director of all the pools in the Middle West, is expected to arrive in Columbus soon. Classifications of all coal to be handled by the pool has been made and all details of accounting have been arranged.

Troy, N. Y.—A vein of soft coal was struck at the Watervliet arsenal on Dec. 27 by workmen who were making an excavation for a new shrinkage pit. The find was made at a depth of 125 ft. and is regarded as genuine bituminous coal, responding to the usual tests. The deposit is located so far down as to preclude what was found being coal from the gun foundries scattered about the reservation at some previous time. The find is looked upon as of the highest importance because the scarcity of soft coal has been felt with particular severity in this locality.

Salt Lake City, Utah—The State Fuel Administration announces the opening soon of three new Utah mines: The Weber, near Coalville; the Wattis, in Carbon County, and the Peerless, of the Standard group, also in Carbon County. In addition, coal deposit owners at Fillmore and Cedar City are urging railroad connections. The Weber is owned chiefly by Clarence and Ernest Bamberger, of Salt Lake City, and is well equipped with modern machinery. The Wattis, financed by Wattis & Wattis, of Ogden, is expected to ship a dozen cars daily after Jan. 1.

Carbondale, Penn.—The Delaware & Hudson Coal Co., in an effort to assist in relieving the coal shortage, has adopted a plan which provides for the taking of all outside workmen from collieries between Plymouth and Carbondale and putting them at work loading cars for shipment. This plan will be followed out Saturday afternoons and every Sunday and whenever the collieries are not working. It is estimated that at present the company has about 200,000 tons of coal in its storage plant which it is impossible to move to market on account of the lack of labor and cars.

Princeton, W. Va.—E. B. Farley, of Spanishburg, and Mayor Davis Thorn, of Princeton, filed suits recently against a group of coal companies for \$10,000 damages each, alleged by reason of dumping of cinders into Bluestone River to be washed onto the plaintiffs' farms. A number of settlements between coal companies and Bluestone land owners in the past few years have been made on the same grounds, it is said. The defendants to these two suits are the Crystal Coal Co., American Coal Co., Louisville Coal Co., Ennis Coal Co. and the Turkey Gap Coal Co.

St. Louis, Mo.—Edward A. Fresen, fuel administrator of Madison County, Illinois, has put a stop to mine owners in his territory organizing real or make-believe retail concerns for marketing their output. He found operators in Edwardsville selling coal at \$3.75 a ton. They explained that they had organized retail companies which had contracted for their entire output. He gave them until the following morning to dissolve their retail companies, with the alternative of having a Federal agent take charge of the mines. By the next morning the retail companies had been dissolved and the mines were selling at the legal price.

Jefferson City, Mo.—In order to prevent confiscation by railroads of coal shipments destined to points in Missouri and Kansas, an agreement has been reached between the fuel administrators of the two states, representatives of the railroads and officials of the Southwestern Coal Operators' Association that such shipments shall be labeled "Emergency." Stickers bearing the words "Emergency Shipment" are to be attached to the waybills and the cars. It has also been decided to forward to Robert S. Lovett, director of priority transportation, a joint protest against the requisitioning of equipment from Western lines for the Atlantic seaboard.

Evansville, Ind.—Articles of incorporation for the so-called municipal coal mine of Benjamin Bosse, mayor, were filed in the county recorder's office here recently. At the same time Mayor Bosse incorporated another mine at Bucksbin, Gibson County, which he will operate as a private venture in partnership with Walter Korff. The "municipal mine" will be operated by the Bosse Coal Co., the incorporators being Mayor Bosse, Walter Korff, manager, and John R. Brill, city attorney, as attorney. The capital stock of the company is placed at \$100,000. The mine is being opened near Chandler, in Warrick County, a few miles east of here.

Cincinnati, Ohio—Heavy ice in the Ohio River, which has formed gorges at several points, is not only barring further river traffic for the time being but is threatening seriously the coal supply of various river coal companies, stored in barges along the Ohio. No sudden break in the gorges, similar to that of some days ago, has yet occurred, but if a thaw should happen in a few days some similar difficulties will be encountered. On the other hand, companies receiving their coal by river have little coal left on hand, on account of the interruption to river shipments for some days past. The ice is very deep and runs from above Cincinnati to Madison.

Columbus, Ohio—On recommendation of George C. Holt, referee, judgments in the amounts of \$2,757,465 and \$86,576 against the Hocking Valley Railroad Co. were filed in New York in favor of Daniel E. Pomeroy, Walter Buckner, Lewis L. Clark and Stacy G. Richmond. It was alleged that the railroad company had guaranteed payment of 3500 bonds for \$1000 each issued by the Kanawha & Hocking Coal and Coke Co. in order to facilitate the sale of the bonds. About two-thirds of the bonds passed into possession of the plaintiffs, who sued upon the railroad company's guarantee when the coal and coke company failed to meet its mortgage obligations.

Greensburg, Penn.—An agreement for the consolidation of the Westmoreland Coal Co., the Penn Gas Coal Co. and the Manor Gas Coal Co., dated Dec. 4, has been filed in the recorder of deeds' office here. The directorate of the three companies is identical. The main offices of the companies are in Philadelphia, while the mines are located in Westmoreland County. The name of the merged company will be the Westmoreland Coal Co. and its officers and directors will be: President, S. Pemberton Hutchinson; vice president, George McCall; secretary, Howard R. Yearsley; treasurer, Herman Roll, all of Philadelphia. The company has been recapitalized at \$10,000,000.

Cincinnati, Ohio—Col. Lansing H. Beach, of the United States Corps of Engineers, in charge of river improvement on the Ohio, has asked the aid of the Chamber of Commerce in a plan for compiling statistics showing the probable amount of freight which is available for river shipment. In order to encourage the formation of companies to operate boat lines on the Ohio. The Government, through the engineers and local commercial bodies, intends to cooperate with shippers by using every effort to secure for them facilities for moving freight by river, in view of the heavy congestion of traffic on the railroads. The Chamber of Commerce, through its traffic bureau, is responding by making a thorough canvass of Cincinnati business men, and a large mass of data on the subject will be collected.

Dallas, Tex.—Coal operators of Oklahoma and members of the Choctaw and Chickasaw Indian tribes are much elated over the passage by the National House of Representatives of the bill by Representative Carter, of Oklahoma, providing for the sale of the mineral lands in Oklahoma owned by these two tribes. Coal operators believe the sale of these lands, amounting to more than 400,000 acres of coal lands located in the vicinity of McAlester and several thousand acres of asphalt, deposits near Ardmore, will greatly stimulate the coal-mining industry in Oklahoma. Approximately 100,000 acres of the coal lands are now under lease, but the remaining 300,000 acres are undeveloped. An appraisement made some years ago placed a value of \$12,000,000 on the coal available on this land. Under the terms of the bill, the Secretary of the Interior is authorized to formulate rules and regulations for the sale. The appraisement is to be completed six months after the appointment of appraisers. The lands are to be advertised and sold at public auction 90 days after the report of the appraisers has been submitted. At the expiration of the first year, the remaining unsold land and any forfeited land is to be again offered for sale to the highest bidder. An appropriation of \$50,000 is made to cover cost of appraisement and sale of the lands.

MARKET DEPARTMENT

GENERAL REVIEW

Excessive cold causes sharp increase in domestic demand. Industrial conditions in New England becoming critical. Government takes steps to relieve local domestic shortage.

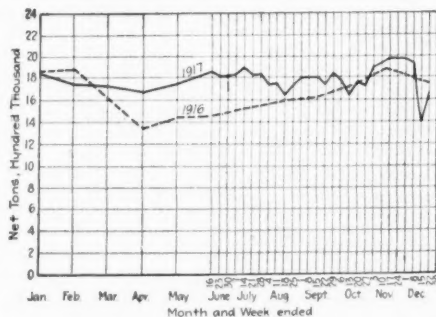
Anthracite—The production of anthracite was naturally slightly curtailed last week on account of the holidays. This curtailment, however, was not as great as is often the case, since many of the miners observed only Christmas Day and did not take the three days to two weeks' lay-off which they frequently do at this season of the year. The intense cold which descended upon the eastern portion of the United States with temperatures in many instances well below the zero mark, and exceptional for this territory, coupled with a decided shortage of fuel throughout the East generally, caused considerable suffering in many localities. So far as is known, little advantage was taken of the stringent conditions by small retailers to boost the price to exorbitant levels. One or two instances of this kind have, however, come to light, and the offenders were promptly arrested. The larger towns and cities, while suffering to a considerable degree, were probably not in as bad condition as some of the country districts. Centers of dense population, such as New York and Philadelphia, may be relieved of coal scarcity much more easily than where the population is scattered. The orders of Secretary McAdoo throwing open to coal traffic the passenger tunnels of the Pennsylvania R.R. under the Hudson River will doubtless do much to relieve fuel scarcity in some of the boroughs of New York City.

Bituminous—The demand for bituminous coal shows no signs of lessening or abating. The steam demand, which has for months been insistent, is now quite as much so as ever. Many industrial plants, some of them engaged in war munition work, have been compelled to shut down for more or less extended periods, while many others are operating on a day-to-day supply. As has been the case heretofore, much of this stringency could be relieved if transportation facilities were available. There is little question but that New England, which ordinarily gets a large portion of its soft coal by water will this year be compelled to ship it in all-rail from the mines of Pennsylvania and West Virginia. There is not, and of necessity will not be, much choice exercised as to the grade or quality of coal to be secured. What is needed is something that will burn and make steam. It makes little difference whether this is slack, run-of-mine or lump. The price is, and has been for some time, an entirely secondary consideration. Transportation facilities have also been considerably affected by the cold weather throughout the Middle West. In this region many mines are working two or three days per week, where the operators and miners would gladly work them six or possibly even seven days per week if cars for loading could be secured. It is yet too early to say what government control of the common carriers will do to relieve the situation, but it is strongly hoped that a gradual improvement will take place. Many schemes have been brought forward, tending toward the conservation of fuel. Among the most prominent means is that of lightless nights. In many cities one or two such nights are observed each week, while it is strongly urged that at least six be observed in the future. Lightless nights at present means the abolition of glaring electric signs and similar electrical displays. In many instances the abolition of street lighting, either wholly or in part might well be followed. It would appear that at least when the moon is full, or nearly so, and the ground is covered with snow, there is little real need for street lighting except at dangerous street crossings and similar localities. Throughout the entire country there is a decided and insistent demand for both domestic and industrial fuel.

A Year Ago—Anthracite stocks at a minimum and the situation is threatening. Negotiations on new bituminous contracts at \$3 and better. Railroads confiscating coal and placing more rigid embargoes. A shortage of famine proportions threatened in the Middle West.

COAL PRODUCTION

The depression in the bituminous industry caused by prolonged cold weather continued during the week of Dec. 22. The total production of soft coal (including coal made into coke) is estimated as 9,917,145 net tons. This, although a substantial recovery when compared with the preceding week, was still 10.8 per cent. below the output during the week of Dec. 8. The average production per working day was 1,652,858 tons, as compared with 1,638,513 tons



during mid-August, at the time of the coal strikes in Illinois and the southern Appalachians. Beehive coke reflected the recovery in the entire bituminous industry. The total production during the week is estimated as 545,433 net tons, an average per working day of 90,906 tons. This was still 10.4 per cent. below the production during the week of Dec. 8. Shipments reported by the pine anthracite carriers amounted to 36,060 cars, an increase of 4382 cars over the preceding week. The production of anthracite, however, was still 11.3 per cent. below the mark set during the week of Dec. 8.

CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS WEEK ENDED:

District	Dec. 1	Dec. 8	Dec. 15	Dec. 22
Bituminous shipments, 114 roads...	182,275	198,161	149,122*	176,695†
Anthracite shipments, 9 roads...	37,533	40,566	31,672*	36,060†
Beehive coke shipments, 4 roads...	13,055	12,509	10,335*	11,197†

* Revised from last report. † Subject to revision.

BUSINESS OPINIONS

The Iron Age—The expected announcement by the President that iron and steel prices would remain in effect for three months longer was made on Dec. 28. With it came the proviso, agreed to at a meeting of steel manufacturers and the War Industries Board held the same day, that on contracts made in the next three months prices would be revised on deliveries after Apr. 1 to conform to any changes that might become effective on that date.

Bradstreets—The big feature of the week is provided by the Government assuming control of the railways, while temporary dullness in trade is the distinguishing characteristic of the post-holiday period. Inventorying is the rule and salesmen are off the road. Christmas buying in the final days of the season was markedly rushed at some markets, but fell behind at others. But underneath all is the fact that the outlook for 1918 is deemed encouraging, though not by any means ultraoptimistic, there being enough uncertainty ahead as regards world politics, not to mention high prices, to dictate caution.

The American Wool and Cotton Reporter—Quiet has prevailed in the wool market for the week under review, owing to the recent Government regulation, the holiday season and inventory taking.

The Dry Goods Economist—Coal shortage still hampers production of war munitions and of merchandise, and while some scattered improvement is noted, the general fuel situation is far from satisfactory.

Marshall Field & Co.—The current wholesale distribution of dry goods for the week

shows a marked increase over the shipments for the same period in 1916. The total volume of road sales for both immediate and future deliveries has been in excess of the volume for the corresponding week a year ago. Merchants have been in the market in fewer numbers. Collections continue very good. The market on domestic cotton remains firm.

Atlantic Seaboard

BOSTON

Situation most acute. More serious than public realizes. Said to be only four days' supply in Boston. Many plants inland have shut down and bitter cold causes untold distress in cities. Fuel Administration begins to be definite about relief measures, but many difficulties in the way. Railroads themselves on narrow margins of supply. Frozen coal and ice at loading piers still further impedes shipments. Doctor Garfield's order not unexpected.

Bituminous—The coldest day on record, Dec. 30, and the worst fuel shortage known, suggest in a word the coal situation in New England. Boston retailers are driven to distraction, and on Dec. 31 had in several instances closed their doors to protect their property from angry householders. One small wharf handled 700 people during the day, giving each not over 100 lb. of pea to relieve distress overnight. Police protection is now the regular order at all the wharves where there is any coal. Bituminous is being distributed to consumers who require fuel for heaters, what anthracite is to be had being saved mostly for those who require it for small stove use. The schools have been ordered closed for three days longer. Apartment houses are hard hit by the shortage, as few have bins that are adequate.

Boston is down to 4 days' supply of all kinds, according to reliable information. A great difficulty lies in the unevenness of the supply on the different wharves. A number of dealers are entirely out, while others who have small tonnages are reserving them for their regular trade. These dealers, therefore, do not consider themselves under obligation to distribute to the customers of other dealers, and all-told it is a most acute and anxious situation.

At wholesale, conditions are only better because steam-users have a better understanding of the state the country is in and for them shutting down their plants is their only alternative. In spite of all efforts to accumulate stocks during the spring and summer the railroads themselves are down to narrower margins of supply than the public is aware. Nevertheless the roads are taking a broad-minded attitude and when cargoes are en route to relieve mills and utility plants that have either shut down or are about to, they have been given real assistance. Just recently one of the railroads gave a large paper mill permission to send a crew of men to a storage pile near Boston, 150 miles from the mill, to shovel coal aboard cars, no local labor being available.

Long delays in movement are still characteristic. A barge loaded in New York, Nov. 28, arrived in Providence on Dec. 29 and was then unable to reach the railroad discharging piers because of ice. Coal at Baltimore and all the other loading ports is frozen so hard that freeing cars is accomplished only with the greatest difficulty. Modern handling seems unable to cope with such conditions; the coal literally has to be mined out of the cars.

More than 100 bottoms are reputed to be waiting at Hampton Roads, some of them since early December. Upon cargoes for these boats a large number of plants inland are depending for supply, and conditions are decidedly serious. If there ever was a time when Government efficiency could make a showing, it is now. Officials have complained that they were lacking authority to take necessary steps, and have passed the responsibility from one to another. Now that there is unified control of the railroads they are under an agency of the Government and there is opportunity to act.

It is gratifying that state fuel administrators begin to be concrete. The report comes that 500 cars at a congested switch-

ing point on the Western Maryland have been diverted from original consignments and have been ordered to Baltimore via the B. & O. for Curtis Bay piers for loading into bottoms for New England, the coal to be handled by the New England Fuel Administrator and distributed by him on arrival. A further consignment of 1000 cars, assembled from a number of operations from different roads, is reported to be promised for loading at Philadelphia or Baltimore, as may seem advisable. This coal is from West Virginia output, and is understood to come forward on the Government price, although it must be replaced to the original consignees from whom it was diverted to relieve congestion.

However, the New England Fuel Administration will have to find boats and the task will not be easy. The Shipping Board is rumored to have given one steamer at Baltimore for one trip, but coal men are not yet advised about any other boats to load what must approximate 75,000 tons. In effect, the whole arrangement means distribution by the Fuel Administration rather than through the usual channels.

Re-handling plants at Providence and Portland are being strongly advised by local fuel committees to keep such stocks of bituminous as they have for local distribution in place of anthracite, where absolutely necessary. With large plants inland, to which the rehandlers are committed by contract, on the point of shutting down, it is certainly an awkward position to be in. Emergency calls from plants other than those having contracts have had to be turned down, for dispatch at Hampton Roads is not improving. Notwithstanding this, steam users inland from Portland, for instance, are being advised not to seek all-rail shipments but to look to Portland for current supply.

This week, if there are receipts of either anthracite or bituminous by water, there are likely to be cases of seizure under the Lever Act. Single carloads in terminal yards here were seized last week, and distribution made through local dealers.

No quotations are heard in any direction. No one has coal for sale, and the outlook is pretty black. About the only ray of comfort now is the promise of milder weather, with snow!

Doctor Garfield's order of Dec. 24 in connection with the railroad proclamation of Dec. 26, was not unexpected. On every hand in the coal trade there is a disposition to cooperate to the fullest extent. A more complicated situation cannot be imagined.

Anthracite—The Providence, R. I., fuel committee granted an advance of 75c., making the present retail price \$10.50 per ton of 2000 lb., sidewalk delivery. This is the largest advance yet reported, and is in recognition of extra costs.

Receipts from Philadelphia are light. Tows are much hampered by severe weather while ice and slow dumping interfere seriously with shipments. In New York ports anthracite company barges are lying idle and have been for weeks while the effort was made to meet the exacting demands in New York City.

NEW YORK

New York faces a coal famine. Intense cold wave causes much suffering, but hope is seen in increased receipts and further economies in consumption. Steam coals fall in quantity and office occupants suffer. Bituminous demand increases because of hard-coal shortage. Shipping fails to improve but coal is promised. Drivers threaten to tie up deliveries.

This city has been brought face to face with the most serious coal shortage in its history and what has been feared for some time has become a reality. With the mercury down to 13 deg. below zero, which was 7 deg. lower than any previous mark in the records of the Weather Bureau, the city suffered greatly from the lack of fuel. Efforts were made by everyone in authority to relieve the situation, and although appeals were being constantly made to the Fuel Administrators, nothing could be accomplished. In the meantime the public was in need of coal.

Every effort is being made to conserve fuel and a committee representing the heat, light and power companies, consisting of Louis P. Gawtry, of the Consolidated Gas Co., F. W. Smith, of the United General Electric Co., and C. A. Gillham, of the New York Steam Co., submitted a report to State Fuel Administrator Wiggins recommending six lightless nights a week, Saturday being the only exception, for every city and hamlet in the state. This report, which was made an order, became effective on Wednesday night of this week, and shuts down all advertising signs and will reduce the number of street lights, wherever possible.

The Conservation Committee of the Fuel Administration, headed by Harry T. Peters, of Williams & Peters, is using every effort

to ease conditions and have adopted the card system for the purchase of coal. John Whiteley, of Whitney & Kemmerer, a member of the committee, made a tour of the coal docks in the harbor and reported there were sufficient stocks of coal to meet actual requirements but steam facilities were not sufficient to keep the coal moving, while in the city there is not sufficient storage room to safeguard the city beyond a few days at a time. James A. Hill, of the Knickerbocker Fuel Co., No. 1 Broadway, recently added to this committee, will shortly make a report covering the bituminous trade in the city.

Arthur F. Rice, Commissioner of the Coal Merchants' Association, who will have charge of the card distribution in Manhattan and the Bronx, has promised the hearty cooperation of the dealers in the efforts to conserve fuel, and has also written the dealers setting forth the efforts being made to prevent over-purchases of coal and telling them of the coal-card system to be used.

The lack of coal was felt more in the poorer sections of the city, where a tour of the coal cellars showed that more than 50 per cent. of the peddlers were without supplies. Conditions fully as serious prevailed in other sections and dealers instead of delivering coal, disposed of their supplies in small quantities. Sunday was no exception and many of the yards were open, policemen keeping the customers in line to prevent a scramble for coal.

Failure to get coal has driven occupants of flat houses into the police courts for aid, and complaints of over-charging on the part of cellar dealers has caused the Federal District Attorney to order an investigation.

On top of the present conditions the drivers and auto operators have made demands upon the retail dealers which will aggregate increases in wages of about \$5 per week. They also want inserted in the agreement a provision whereby they will receive a bonus or present of \$5 at Christmas. The matter was referred to the County Fuel Administrator and will probably be adjusted without a strike.

The gas companies benefited by the stringency of the coal situation during the cold wave, demands upon them being increased by 50 per cent.

While it is believed a few days of mild weather will result in New York getting sufficient coal for its immediate needs, there are some who think the situation can best be relieved by a pooling of coal at the various docks.

Production has not been up to expectations. In addition to taking Christmas Day off, employees at some of the mines remained away for the next day. This week there was another holiday and this means a further reduction in production. The output was also reduced during the cold weather of the past week, but all companies made efforts to work steadily.

Secretary McAdoo's orders opening the Pennsylvania's passenger tunnels to coal traffic appears a wise edict. Coal entering Manhattan by this route will not be unloaded within the borough, but will pass under the city to various Long Island points. At Long Island City it may be unloaded and brought back to New York by motor truck over one or more of the East River bridges.

Buyers are ready to purchase anything that looks like coal, not even considering the size.

The scarcity of the steam coals continues and the large consumers are fearful of the outlook. During the cold weather of this week many of the big office buildings were almost without heat and some of the tenants installed oil heaters, while others, on Monday, locked their doors and went home for the day.

Instead of the high quotations for steam sizes, given a couple of weeks ago, most of the prices now asked for individual coals are close to circular. However, there is no coal to be had.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports, are as follows.

	Circular	Individual
Broken.....	\$6.30	\$7.05
Egg.....	6.20	6.95
Stove.....	6.45	7.20
Chestnut.....	6.55	7.30
Pea.....	5.05	5.80
Buck.....	4.30@5.00	5.05@5.75
Rice.....	3.75@3.95	4.50@4.75
Barley.....	3.25@3.50	4.00@4.25
Boiler.....	3.50@3.75	

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—These are critical times for the bituminous trade. The situation has grown more serious because of the record-breaking cold wave which settled over this section of the country for four days. There

was not a pound of coal available for the spot buyer, and many large consumers with contracts were on the verge of closing down their plants. Some plants did suspend operations.

The contract-making period is drawing close and while no one appears ready to make predictions it is apparent that few operators intend to tie up any large part of their output at the present prices, unless it be with a large consumer whose business they desire to retain. However, the Fuel Administration authorities will supervise all contracts and see that none is made for more than one year.

The shipping situation has not improved, although it was stated in newspaper dispatches that there would be 500 cars available early this week for bunkering at one of the lower ports. Vessels leaving here are from 3 to 5 days late, because of the lack of supplies.

One method of solving the present difficulty in transporting coal from the docks is suggested by labor leaders, who advocate Government control of all tugs, etc., in this harbor.

A freer movement of coal is predicted by many since the Government has control of the railroads. One operator with two mines, one located on the Pennsylvania and the other on the New York Central Lines, received 23 cars out of 138 required during November and December at the mine on the Pennsylvania Lines, and 22 out of 46 required at the other mine on the New York Central for the same two months. The same operator shipped coal about the middle of December, which had not reached its destination on the last day of the year.

The demand for bituminous has been increased by the shortage of anthracite, many users of the latter being anxious now to obtain a supply of bituminous to mix with anthracite culm. Factories working on war contracts have limited supplies. Large consumers of anthracite, city departments among them, have made inquiries regarding bituminous coal, only to be told that the conditions were as bad as in the hard-coal market. Few of the big institutions, including hospitals, have more than a few days' supplies ahead.

Deliveries have been impeded greatly by the heavy ice in the rivers and Bay.

Some shippers contend that the purchaser of the cheaper grades has a better chance of getting his coal than the buyer of the better grades for the reason that if the Government needs coal it will confiscate the better coals first.

PHILADELPHIA

Anthracite trade expects relief through Governmental control of railroads. New retail gross margin causes protest. Individual shippers get top prices now. Intense cold interferes with shipments. New contract forms prepared. Bituminous supply below demand. Car supply unimproved. Some plants closed. Advance in prices still looked for.

Anthracite—The announcement of the Government control of the railroads was received with satisfaction by the anthracite trade. Particularly was this so when it was stated early in the week that the entire Philadelphia & Reading system was to be devoted solely to the carrying of freight, with the elimination of all passenger service, except to a few non-competitive points. This decision was made on account of the Reading being the most important of the anthracite carriers. It is believed that the new plan will remedy the car shortage and that there will be no recurrence of the near-famine which beset the city recently. It will now be possible to send the empties where they are most needed, regardless of the road to whom they belong.

The announcement by Chairman Lewis of the city fuel committee and approved by State Administrator Potter, that effective Jan. 1 the retailers were permitted to increase their gross margin of profit to \$2.50 per ton has caused a storm of protest from press and public. After weeks of investigation the authorities decided the dealers were not receiving a fair return on their investments and authorized the advance without giving the press a detailed report of the facts on which their findings were based. They simply stated that the increased expenses of these abnormal times warranted the increase and refused to be drawn into any controversy over it.

It is not believed that the National Administration will interfere with the action of the state and city bodies. In addition to the complaint of the consumers much confusion was caused by the fact that there is not a flat retail price all around. This was thought to be one of the objects of the new ruling, and while that may have been the intention, the fact that the wholesale prices still vary has caused at least

20 different sets of retail prices to be in effect at the same time. This is brought about by there being separate prices for white ash, red ash and Lykens Valley coal as shipped by the companies, with the individuals allowed 75c. above company prices, and then all of these prices further affected to the extent of 20c. a ton on all coal sold on commission, with a still further variation on account of freight rates. In fact the individual shippers who are combatting Chairman Lewis' plan to do away with their 75c. differential, advance this as a reason that even with its elimination the retail prices will be far from uniform. However, under the \$2.50 gross margin plan the dealers will now be enabled to go right up to Apr. 1 without changing their prices instead of a change every two weeks as under the former system.

Dealers who may be inclined to charge rates in excess of those fixed by the City Fuel Committee now realize that the committee is in earnest. This week a local retailer was arrested for selling coal at an exorbitant price and brought before the United States Commissioner, who held him in \$1000 bail for trial.

There continues to be considerable uneasiness among the independents as to the agitation among the dealers, seconded by the Chairman of the City Fuel Committee, against the differential of 75c. allowed the smaller operators. There are some who express the belief that an adjustment is bound to come, but they hope the present rates will not be disturbed before spring, when an entirely new schedule is expected, especially since the President in his latest statement intimated that he would order a reduction on Apr. 1.

All the anthracite companies are preparing new contract forms in compliance with the recent ruling of Dr. Garfield that such contracts must contain a clause that the contract shall be subject to immediate cancellation at the request of the Fuel Administrator and the coal subject to requisition by the Government. It seems that each move of the Washington authorities brings the matter of Governmental control of the mines more imminent, and the direct intimation this week to this effect by the National Administrator is causing quite an undercurrent of interest throughout the trade.

There is no abatement in the demand for any of the sizes and egg, which in normal times was never much in demand, is now as acceptable as pea, for which the demand is all out of proportion to the other sizes. The steam coals are also particularly active, although operators refrain from charging extreme prices which they no doubt could obtain. Buckwheat, on which size all the companies are far oversold and for which they have ceased taking new business, is being held at \$4.15 by the individuals, although some of it is allowed to go through brokers for an additional 20c. The same can be said of rice based on a \$3.35 price. Barley is now strong at \$2.35, while culm at \$1.50 has gained strength. The feature of this latter material is that so anxious are consumers for fuel that trial orders of single car lots are growing frequent, although repeat orders do not average high. Nevertheless there is a growing number of plants which are steadily using it, especially where the equipment is suitable and the element of objection on the part of firemen can be overcome. It is also reported that one of the railroads has designed a type of fire-box on its locomotives whereby a 35 per cent. fuel saving is effected by mixing two parts of crushed bituminous with one of anthracite silt.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for Tide are as follows:

Line Tide		Line Tide	
Broken.....	\$5.90 \$6.05	Buck.....	\$3.15 \$3.75
Egg.....	4.80 6.00	Rice.....	2.65 3.65
Stove.....	5.05 6.35	Boiler.....	2.45 3.55
Nut.....	5.15 6.40	Barley.....	2.15 2.40
Pea.....	3.75 4.65		

Bituminous—Coal is still extremely short. All consumers frantically urge for greatly increased shipments, yet little improvement is noticeable. Recently the weather has been such as to facilitate rail movement, but such a condition cannot be relied upon at this time of year. However, the car supply at the mines does not improve, and the operation that receives as much as a 40 per cent. allotment is indeed fortunate, as most of them report from 10 to 25 per cent.

Many manufacturing plants continue to run on short supply, with shutdowns quite numerous. Among these is the large oil-cloth plant of which State Fuel Administrator Potter is president, which has been closed for an entire week on account of lack of fuel. Up to this time the fuel

administration has given little attention to the bituminous situation, the entire time being taken up in placing the anthracite domestic trade on a stable basis. This having been about accomplished its energies will now be turned toward helping the bituminous situation.

About the only activity in the way of spot business continues to be in coal sold for blacksmithing purposes. There is a fair volume of this business being placed and many coals not heretofore regarded as particularly adapted for this purpose are finding their way into this trade. Prices range from \$4.50 to \$5.75 per net ton, with all orders taken subject to delay.

Some interest was created by the announcement of the National Fuel Administrator that he would supervise all new contracts for the coming year to the extent that he would insist on a clause being written into each one providing for the diversion of coal in transit if so deemed necessary by the fuel authorities. Most shippers are of the opinion that this ruling differs in effect little from the practice of ordering priority shipments; at least it will have the same result. There is little likelihood of any considerable contract business being closed for the new year unless some concession in the way of higher prices is allowed. Rumors of new prices continue to be rampant and there are those who are willing to profess a belief that the new price will be forthcoming any day now. The consensus of opinion as to the increase seems to be that the advance will be from 80 to 90c. per net ton.

BALTIMORE

Baltimore closed the old year and started the new with famine-like conditions for both hard and soft coal. Big industries work part time.

Bituminous—Priority movement having failed largely and been wiped out by Federal order, the consumers of soft coal here faced almost famine-like conditions for the close of the old year and the start of the new. Many of the large corporations, including the street railways and lighting companies, shipbuilding and general war-product works, had from 24- to 48-hour supplies of coal at times. Service was curtailed in numerous cases, and the Bethlehem Steel Co. had to shut down a part of its big plant and shipyard.

Other big shipyards were hurt by failure to get coal or coke, the latter having disappeared from the market, even when given priority shipment rights by the Government. Small consumers were being cared for after a fashion by the contract receipts, or by appeals through the fuel administrator here and his submission of cases to a jobbers' committee. By apportioning these urgent calls the jobbers managed to keep the smaller industries all working, but it was a narrow squeeze at times.

Anthracite—The receipts of hard coal here are still averaging about 20 to 25 cars, against a normal daily need in winter of about 60 cars. The need is really greater because of the shortage heretofore existing. Many homes are heated solely by gas and oil heaters. The poor have been cared for in many cases by bushel sales of soft coal by the city at cost. Numerous institutions and churches are without coal, and there have been consolidations of work in some cases to get fuel results. Throughout the city there were often lines of people at coal yards to get fuel, while some yards were forced to close because they had no more coal to sell. The zero weather over several days caused much suffering, and the death list from pneumonia mounted alarmingly.

Lake Markets

PITTSBURGH

Pittsburgh domestic supply improved. Steel industry still suffers. Improvement from Government railroad control expected to be gradual. No holiday Jan. 1.

The municipal government of Pittsburgh announces that it intends to enforce rigidly the decree for lightless nights, Sundays and Thursdays, all unnecessary illumination to be eliminated. There was a considerable number of offenders last Sunday night and they are to be dealt with as strenuously as possible. The local fuel administration reports a great improvement as to supplies for domestic use, conditions being now almost normal. Relief was afforded chiefly through the receipt of coal by river.

There is a little improvement as to supplies of coal in this general district for plants making munitions, and little production is now being lost on this account. At the steel mills, however, there is scarcely any improvement and at some important works operations are far below normal.

The worst case is that of the Republic Iron and Steel Co., the Bessemer department at its Youngstown works having been down for three weeks, there being insufficient coal to operate the finishing departments. This reduces the company's finished steel output by one-half.

Car supplies at mines have been slightly better thus far this week. The holiday, Tuesday, was not observed, either in placing cars or in loading coal, and if the better conditions continue through the week this will be the best week in four for coal shipments.

The view of the coal trade as to Government control of the railroads is that there will probably be a great improvement in coal movement eventually, but that the improvement will be very gradual, for the reason that the railroads must await the formal removal of the legal barriers against pooling. The General Operating Committee was unable to accomplish nearly as much as was expected, because it could not re-route much freight and could not place locomotives on the divisions that needed additional motive power.

Talk of coal shortage has reached such a point that it has gotten on the nerves of the majority of coal operators, who are taking pains now to tell everybody that there is no shortage of coal as coal; it is a shortage of motive power, whereby the coal is at mine instead of where it is wanted. This statement is said to represent precisely the verdict of the meeting of the national association of coal producers held in Pittsburgh last week.

There is scarcely any free coal in the market, but keen buyers are able to pick up odd lots now and then. The market remains quotable as follows: Slack, \$2.20; mine-run, \$2.45; screened, \$2.70, per net ton at mine, Pittsburgh district, with 15c. additional permitted to be charged when sales are made by brokers.

BUFFALO

Anthracite scarcer. Distribution better. No danger of a famine here this winter. Bituminous threatens to give out. Many plants with small supply. A survey may be ordered.

Bituminous—Every week, indeed every day, the report is that the supply of coal runs shorter. But for the fact that this has been the case for several months one would think there was no coal of account in the country. The fact is that the demand is far more than it ever was before and the amount of all sorts of manufactured goods being produced is immense. A rail trip in any direction will show this to be true. Coal is moving, but not as fast as certain other freight seems to be.

A survey of the bituminous supply of this district will have to be made at once or there may be general disaster from want of fuel. So many people use coal and light carelessly that they become fairly unaware of it and it will take some sort of jolt to stop the practice. An effort is to be made also to obtain Government permission to pay wagon or "country-bank" mines more than 75 cents a ton extra, as it is held that they cannot operate on that differential without a loss.

Most bituminous shippers adhere to Government prices, though it is claimed that all do not. The prices are as follows, per net ton, f.o.b. Buffalo:

	Slack	Lump
Pittsburgh.....	\$3.75	\$4.25
Bessemer.....	3.70	4.20
Allegheny Valley.....	3.60	4.10

Anthracite—The shippers are not sending much coal this way just now and the severe weather is keeping up the demand. Natural gas runs low and many coal furnaces are not doing much better. December alone has given us as much winter as is sometimes experienced during the whole season and there is time for two or three months more of the same conditions. Anthracite users are becoming alarmed. Canadian retailers through the Buffalo shipping offices, some coming with the announcement that they intend to stay till they get a supply.

At the same time the shippers feel that they have covered the western anthracite-consuming field pretty well and have no fear of a famine, even if the winter goes on as it has begun. If there is no coal in retailers' yards it is because it has been taken by consumers. The fuel administrator has taken care of all complaints, which do not now come in in as great numbers as they do through the poor office in ordinary winters. Work is so plenty that no one need be idle.

TORONTO

Anthracite in active demand. Coal coming forward freely, but deliveries retarded by labor shortage. Prospective increase in prices.

Cold weather has increased the demand for anthracite for domestic purposes, and dealers are kept busy, deliveries being generally restricted to lots sufficient only for immediate needs. Coal is now coming forward more freely from the mines and transportation conditions are now regarded as fairly satisfactory. The principal difficulty in filling orders is caused by labor shortage, which is still acutely felt in all lines of industry. Prices are firm and for the present unchanged, though an advance of 15 per cent. per ton is anticipated shortly in view of the increase in freight rates.

Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove, nut and grate, \$9.85; pea, \$8.85; bituminous steam, \$9; slack, \$8 to \$8.50; domestic lump, \$10; cannel, \$11; wholesale f.o.b. cars at destination, three-quarter lump, \$7 to \$7.50; slack, \$6.85 to \$7.

DETROIT

Steam coal situation is reported temporarily relieved. Domestic supply is short. More than 2600 homes on police list.

Bituminous—Some improvement is reported in volume of incoming shipments of steam coal. Action by President Wilson in placing operation of the railroads under Government control is counted on to remove congestion existing on lines of coal carriers in Ohio and increase the supply of fuel for Detroit. Temporary provision has been made for requirements of the Detroit City Gas Co. and the Detroit Edison Co., both of which were getting low. Henry Ford & Son, tractor manufacturers in Dearborn, a suburb of Detroit, have called on the fuel administration for aid, the company having turned over its fuel supply for relief of some 200 families in the village, who were without coal.

Demand for steam coal continues pressing. One large industrial plant engaged in manufacture of munitions of war was closed a week, because coal was not to be had. Numerous other factories are working on day-to-day supply with the possibility of being obliged to close, ever before them.

Another period of extremely cold weather, with near zero temperature, is causing suffering in homes unsupplied with coal and an increasing consumption of fuel in others.

Anthracite—After more than a week's delay, the work of unloading the cargo of 9000 tons of anthracite from the Lake steamer "B. F. Berry" has been begun by a syndicate of coal men, who with the approval of the state coal administration, have purchased the cargo. The work proceeds slowly and the coal apparently is not reducing the number of orders received by the police department, which, on Dec. 29, exceeded 2600. A small amount of anthracite is coming to Detroit by rail. Efforts of citizens to obtain coal are disappointingly unsuccessful in most cases. Many of the dealers decline to supply those who are not regular customers. This works a severe hardship on numerous families that have come to Detroit during the year.

COLUMBUS

Another cold spell has once more tightened the coal trade in central Ohio. Demand from domestic users is as strong as ever. Fuel committee says the situation is well in hand.

With another cold spell covering Ohio, with temperatures hovering around the zero mark, the coal situation again becomes strenuous. Domestic users are clamoring for supplies and dealers are hard put to it to get supplies and make deliveries. Steam users are also short of fuel and the same is true of all public utilities and institutions. It is believed that the situation in the Buckeye State is as bad if not worse than during the blizzard of several weeks ago. Steps are being taken by the Ohio Fuel Administration through the county committees to relieve the situation.

Under the direction of the Fuel Administration dealers are restricting deliveries to two tons at the most. Because of a shortage of wagons and trucks, many of the purchasers are hauling their own supply of fuel. Consumers are not insisting on any special variety of coal, but are content with any kind or grade. Among apartment houses and office buildings the supply for current use appears to be adequate. Retail prices are maintained at the levels fixed by the county committee. Retail stocks are not large, but arrivals of cargoes are reported from day to day. The situation outside of Columbus and more especially in the Miami Valley is much worse than in Columbus.

Prices on short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Sized grades.....	\$2.70	\$3.05	\$2.70
Mine run.....	2.45	2.70	2.45
Screenings.....	2.20	2.45	2.20

CINCINNATI

Severe weather again prevails, accentuating continued scarcity of coal, due to traffic conditions. The situation is serious.

Another period of severe weather, beginning on Friday, with more snow, has again emphasized the fact that the coal situation is far from settled, and that, on the contrary, the limited production due to the inability of the railroads to furnish cars and move them when loaded has resulted in a severe shortage of fuel of all sorts.

Domestic consumers, who are receiving first attention on account of the suffering that results from a lack of coal for heating, are getting small quantities from dealers, but there is literally not enough coal to go around, even when it is doled out in half-ton lots, as is being done. Many industrial concerns, public utilities, electric railroads, etc., are also facing the necessity of shutting down, and some have already closed on account of a lack of fuel necessary to keep going.

Cincinnati street-car service was interrupted, although only for brief periods, on several occasions recently, on this account, and, since the temporary supply of coal furnished from cars on tracks consigned to Lake ports, released through the cancellation of the so-called priority order, has been exhausted and no similar supply is now available, the present cold weather bids fair to cause more suffering than that which occurred just before Christmas. The situation is calling for anxious thought on the part of the trade, as well as of local and Federal authorities, as no means of relief for the near future is in sight.

LOUISVILLE

Kentucky coal trade receives hopefully news that Government will direct railroads. Priority regulations control industrial coal with little left for non-preferred industries.

The Kentucky coal trade received the news that the United States Government was to take over the railroads hopefully. Things have been so bad where car supply and embargoes have been concerned that the coal operators feel that any change would be an improvement. More cold weather has exhausted practically all of the retail stocks, while the cold has seen another failure of the natural gas supply in Louisville and central Kentucky towns.

Most retailers are a full week behind on deliveries. Inquiries of operators and coal selling organizations made by industrial consumers are numerous. In spite of the fact that there has been a fair supply of cars during the week a large proportion of the operators are not quoting on such inquiries. There is much criticism over the manner of application of the priority rules. One result is to concentrate shipments on one point, with the result that coal is accumulated there in larger quantities than are required and that there is further traffic-delaying congestion.

BIRMINGHAM

Short production last week seriously affects coal supply. Another cold spell causes retail yards to be besieged by householders. Most yards without stocks and but little coal in transit. Steam users clamoring for shipments more vigorously than ever.

Mine workers failed to respond to the earnest requests from the fuel administration and from mine owners to work steadily through the holidays and the production for the past week fell off from 33 1/2 to 50 per cent. as a result. This loss in tonnage was seriously felt at this time when coal is badly needed, and distributors were besieged with personal appeals, telegrams and letters urging the shipment of both steam and domestic coal.

Local sales agents and brokers received wires from the fuel administrators of several states asking that coal be shipped to certain points in their jurisdiction and priority orders were also received from the national officials. Many of these requests could not be complied with, as explained by coal men, for the simple reason that they had no coal to meet such demands. Appeals came from many industrial plants, both through personal calls and by wire, stating that they were working on government contracts and were facing loss of time unless relief could be furnished in the shape of more fuel.

Another cold spell the last of the week sent the thermometer down to about 8 deg. above zero and resulted in the cleaning up of what little coal was in local yards. Movement of coal from the mines is slow and cars sometimes stay in local railroad terminals for three and four days before delivery is made to consignees. State fuel administrator S. P. Kennedy has brought to the attention of the national fuel administrator the seriousness of the domestic situation and asked for authority to direct shipments to local yards and other points

in the state where the supply is practically exhausted and dealers are unable to secure any coal to supply the suffering public.

Coal operators have worked out a plan for the distribution of coal from each field, which will be submitted to the national administrator and urged for adoption. Briefly, the new method of handling the coal supply calls for the appointment of a distribution committee in each field, which will handle the coal mined in that section. Each coal-producing section will have a member of its distribution committee resident in Washington who will receive from the national fuel director priority orders for coal to be shipped from his respective section and he in turn will forward such orders to his home committee for placing at such mines as can care for the business without interference with the movement of coal being supplied to industrial plants, public utilities and other interests essential to the public and national welfare.

It is claimed that this mode of procedure will secure an equitable and wise distribution of coal, and at the same time avoid the confusion which is now being caused by conflicting priority orders being received from national and state administrators, some of which are cancelled and superseded by from two to three orders before the coal can be billed out to the original consignees.

Coke

CONNELLSVILLE

Car supplies improving slightly. Much blast furnace idleness. Poor quality of coke and explanation thereof. Contracts expiring and coming into force.

Car supplies Monday and Tuesday of this week were 50 per cent. and 30 per cent. respectively, with hopes that the week as a whole will make a better showing than any of the preceding three. Receipts of coke at blast furnaces have perhaps improved a trifle, but there is no general improvement distinctly observable, and the best estimate that can be secured is that merchant blast furnace operations average 80 per cent. of capacity while the steel works blast furnaces are averaging 70 to 75 per cent. Close estimates, however, are extremely difficult.

There has been much complaint by blast furnaces of poor coke, consumption per ton of pig iron being claimed to run up as high as 2900 lb., when the standard for the ores customarily used is about 2200 lb. when making basic iron and 2400 lb. when making foundry. If this condition is common it would explain why the reported operation of blast furnaces is lower than would be indicated by the reported shipments of coke, particularly as banking consumes coke without producing iron.

As to poor coke, the operators lay the blame on the railroads, observing that the roads allot cars in proportion to the number of ovens operating. If an operator blows out ovens when he receives less than his requirement in cars, his requirement is thereby cut down, so that the turn-about operations would eventually result in no cars being furnished and no ovens being operated. The recourse is to keep ovens in blast and hold the charge, the quality of which is reduced after 72 hours.

A number of furnace coke contracts expired Dec. 31, these being chiefly agreements that were made for 1917 or contracts that were made first for the half year and then extended for the balance of the year. On the other hand many of the contracts made just before the set price was announced Sept. 24 were only for the period, a year or a half year, beginning Jan. 1. Both operators and furnacemen have been secretive in the past few months as to contracts entered into, but the best opinion obtainable in the trade is that the volume of contract business expiring Dec. 31 is a trifle greater than the volume of contract business coming into operation Jan. 1. As long as production is restricted, however, there is no prospect of much coke becoming available in the spot market. The market remains quotable at \$6 for furnace, \$7 for 72-hr. selected foundry and \$7.30 for crushed, over 1-in., per ton at ovens.

Buffalo—The situation is unchanged, all coke consumers managing to get a supply out of their contracts. As it is supposed not to be possible to renew these contracts the prospect is of at least some of them being out of such coke at the beginning of the year, though most such contracts go on to April. So far as reported no coke has been sold here at the Government prices of \$7 for foundry and \$6 for furnace at the ovens, yet the complaint of shortage is not heard as is the case with anthracite and bituminous coal.

Middle Western

GENERAL REVIEW

Cold weather continues throughout the Mid-West. Available supply of coal inadequate to meet demands.

During the past week the production of coal has been decreased almost 50% on account of the holiday vacation of the miners and an insufficient car supply, coupled with the cold weather, that has prevailed throughout the Mid-West section. The low temperature that has prevailed almost the entire month of December, has retarded the movement of coal after it was loaded. It has thus increased the demands made on the dealers who in turn naturally look to the operators and jobbers for assistance in tracing and getting to destination delayed shipments. The shortage of hard coal is still noticeable in all sections of the country and in order to relieve this situation it has been necessary for the soft coal producers to make this shortage good. This has been almost an impossibility considering the limited car supply.

The operators everywhere are doubling their efforts to increase production, and hope that shortly they will be able to realize some beneficial results from their energies. According to the statement of Missouri operators the production in that state has been increased, and there is at this time an ample supply on hand at most dealers' yards to care for the immediate needs of their trade. Work in Indiana it is claimed has been fairly good during the past several days, since the Christmas holiday allowed the railroad companies to accumulate sufficient empty coal car equipment to tide the mines over for the remainder of the week. The action of the Government in procuring additional motive power from Western roads, and putting it at work in Indiana has had the effect of increasing the efficiency of some of the coal-carrying roads. At Bicknell the American Mining Co. is constructing one of the largest mines in the state. The new mine it is claimed, will be able to produce 5000 tons daily, and is electrically equipped. The power will be supplied by the Indiana Service Co., from Edwardsport, where a water power station has been built, which furnishes light and power for a wide area in that section of the state.

The situation in Illinois is, what might be considered serious. Railroads are badly crippled, and in need of both cars and motive power. To add to this difficulty, the coal miners have not reported for work during the past week with any regularity, in a manner ignoring the request of the Fuel Administrator that they continue at work throughout the holiday season. In some localities the miners responded nobly but in the majority of cases they did not and as a consequence the production even where cars were to be had slumped badly. Retailers and steam plants have for months been on hand-to-mouth rations, and it is not necessary to call attention to the results noticeable by one familiar with conditions.

CHICAGO

Situation grows more serious. Many plants fear they will be compelled to shut down. Dealers' yards almost bare.

During the past week there has been no change of any consequence in the Chicago market, because of the little coal available and the congested, and near-paralyzed condition of the railroads.

In only a few instances has any Eastern coal arrived in this market with the exception of hard coal in limited quantity. This

makes this market dependent on Illinois and Indiana and coal from these states has reached destination badly delayed. Every precautionary method possible is being applied to insure the coal reaching here, so that all distressing needs may be promptly and properly looked after. The Fuel Administrator for Illinois, together with his staff of assistants, has been working actively and harmoniously with both dealers and operators, in an attempt to make the half supply go around, with the hope that a better supply will be obtainable in the near future, and conditions thus relieved.

Plans are being perfected for the holding of a large and important meeting of the retail coal men in Chicago on Tuesday and Wednesday, Jan. 8 and 9, under the auspices of the National Retail Coal Merchants Association. Invitations have been sent out to a large number of dealers, and the hope is expressed that the attendance will be large and that dealers from all states in the union will be in attendance. Plans will be discussed for equitably distributing coal, also the best means of aiding the Government in handling this necessary commodity.

Placards announcing that the temperature in buildings should not be permitted to rise above 70 deg., were distributed in Chicago recently by representatives of the Building Managers Association. This is intended as a coal-saving measure, and applies to residences, apartments, office buildings and all hotels. The announcement is signed by John E. Williams and Raymond E. Durham of the fuel administration.

Quotations in the Chicago market are as below, per net ton f.o.b. cars at mines:

MILWAUKEE

Government administrator repudiates his latest anthracite schedule and puts dealers in an unpleasant condition. Conflict of authority in coal administration.

It is evident that a cog slipped recently in the Federal fuel administration machinery, and as a result Milwaukee dealers are busy these days in endeavoring to square matters with their customers by marking down their bills. The last report from this market chronicled an advance of 25c. per ton on all grades of anthracite coal, the same being of effect on Dec. 1. After selling for about ten days under the new order, an edict was received which restored the old schedule and directed dealers to rebate the difference to all purchasers.

This is a comparatively easy matter as far as books are concerned, but to make a refund to cash customers will take a great deal of time and labor, which in these busy days is not relished. The readjustment also involves accounts between wholesalers and retailers. The schedule as corrected is as follows: Nut, \$9.45; stove, \$9.35; egg, \$9.10; buckwheat, \$7.55.

A conflict of authority between coal administrators is threatening Wisconsin's coal supply. W. E. Overman, of Minneapolis, was recently appointed fuel administrator for Wisconsin, Minnesota and the Dakotas, and one of his first acts was to order anthracite coal shipped from Wisconsin to the other states named, notwithstanding the objections of W. N. Fitzgerald, the fuel administrator for Wisconsin. The latter appealed to Gov. E. L. Philipp, who at once wired a vigorous protest to Fuel Administrator Garfield, at Washington. Governor Philipp has requested Mr. Garfield to rescind Mr. Overman's orders and allow the present Wisconsin fuel administrator to decide how much coal can be spared. The outcome of the controversy is of great moment to coal consumers.

	Williamson and Franklin County	Saline and Harrisburg	Fulton and Peoria	Springfield	Carterville	Grundy, LaSalle, Bureau and Will
Steam lump.....	\$2.65@2.80	\$2.65@2.80	\$3.00@3.15	\$2.65@2.80	\$2.65@2.80	\$3.35@3.50
Domestic lump.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Egg or furnace.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Small egg or nut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Stove.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Chestnut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Pea.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Washed egg.....	2.65@2.80				2.65@2.80	3.35@3.50
Washed stove.....	2.65@2.80				2.65@2.80	3.35@3.50
Washed nut.....	2.65@2.80				2.65@2.80	3.35@3.50
Mine-run.....	2.40@2.55	2.40@2.55	2.75@2.90	2.40@2.55	2.40@2.55	3.10@3.25
Screenings.....	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30	2.15@2.30	2.85@3.00
Washed slack.....	2.15@2.30				2.15@2.30	2.85@3.00

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Smokeless Pocah. and W. Va.	Penna.	Hocking	West Va. Splint
Dom. lump.....	\$2.65@2.80	\$2.65@2.80	\$3.10@3.25	\$2.60@2.75	\$2.60@2.75	\$3.05@3.20	\$2.85@3.00
Steam lump.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.60@2.75	3.05@3.20	2.85@3.00
Egg.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.60@2.75	3.05@3.20	2.85@3.00
Small egg or nut.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.60@2.75	3.05@3.20	2.85@3.00
Mine-run.....	2.40@2.55	2.40@2.55	2.85@3.00	2.45@2.60	2.45@2.60	2.70@2.85	2.60@2.75
Screenings.....	2.15@2.30	2.15@2.30	2.60@2.75	2.10@2.25	2.10@2.25	2.55@2.70	2.35@2.50

ST. LOUIS

Situation growing critical. No equipment and transportation facilities extremely bad. Mines working one or two days a week. No storage coal ahead, and everything on a day-to-day basis. No Eastern coals.

Seasonable weather with a temperature around the zero mark and the railroads almost out of commission is bringing St. Louis face to face with an actual coal famine. For the past week the railroads have failed signally, not only in the handling of loads but empties as well, and many mines have been idle for three days at a time on account of no equipment.

The coal trade rejoices at the fact that the Government has taken over the railroads. The only solution of the coal problem in the Middle West is in the betterment of transportation. With the railroads properly controlled and conducted, there would be no coal shortage in this region such as exists today.

It may be that there would have been an unusual demand, but it is a certainty that at least 20 per cent. more coal would be on the market if the roads were under a management that got good efficiency out of the equipment.

It is sincerely hoped that the new order of things that went into effect at noon on Dec. 28 will mean a change for the better. Conditions could scarcely be worse than they are now.

The steam plants in and around the city have not over 24 hours' coal supply ahead, and are depending upon the daily supplies brought in.

There is no coal ahead in the retail yards and they are depending upon arrivals from day to day. The consumer is practically on a hand-to-mouth basis, getting coal in small quantities, taking anything he can get. The city is conducting its municipal coal yards in the congested sections and selling coal for 16c. a bushel. This has helped out the poorer sections wonderfully and if it is continued throughout the winter will eliminate a great deal of suffering.

Cars are unloaded promptly by all consignees in the city, although help is scarce. In the Carterville field there has been an unusual supply of cars, but for railroad coal principally. Very little coal going out of this field for commercial business, there is an actual shortage of equipment for such consumption. Movement is extremely slow, and the tonnage is not what it should be on account of many minor causes.

In the Standard district the railroads continue to get the greater portion of the coal. The service here has been unusually bad.

The prevailing market is as follows, per net ton f.o.b. mines:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump.....	\$2.65@2.80	\$2.65@2.80	\$2.65@2.80
3x6-in. egg.....	2.65@2.80	2.65@2.80	2.65@2.80
2x3-in. nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 2 nut.....	2.65@2.80		
No. 3 nut.....	2.65@2.80		
No. 4 nut.....	2.65@2.80		
No. 5 nut.....	2.15@2.30		
2-in. serges.....	2.15@2.30	2.15@2.30	2.15@2.30
2-in. lump.....		2.65@2.80	2.65@2.80
3-in. lump.....		2.65@2.80	2.65@2.80
Steam egg.....	2.65@2.80	2.65@2.80	2.65@2.80
Mine run.....	2.40@2.55	2.40@2.55	2.40@2.55

	Washed:
No. 1.....	\$2.65@2.80
No. 2.....	2.65@2.80
No. 3.....	2.65@2.80
No. 4.....	2.65@2.80
No. 5.....	2.15@2.30

Williamson and Franklin County rate is 87½c.; other fields, 72½c.

KANSAS CITY

Slight improvement in general conditions throughout the Southwest and it is believed that this improvement will continue and grow more pronounced.

Conditions in the Southwest, which have been acute for several weeks, improved slightly the last few days of December, even though the weather became colder. The lighter nights which saved 150 tons of coal per week in Kansas City brought partial relief in the power and light situation. Dealers, who have been taking care of retail business in the tenement districts in good shape recently, were beset by the "basket and sack" brigade at holiday time in numbers never before equalled. But, although the small order trade has been brisk at each cold spell of weather, there does not seem to be the scarcity of money that has attended other severe winters. No real suffering has been reported in the city. Cooperation of coal dealers is credited with the splendid handling of the retail situation here.